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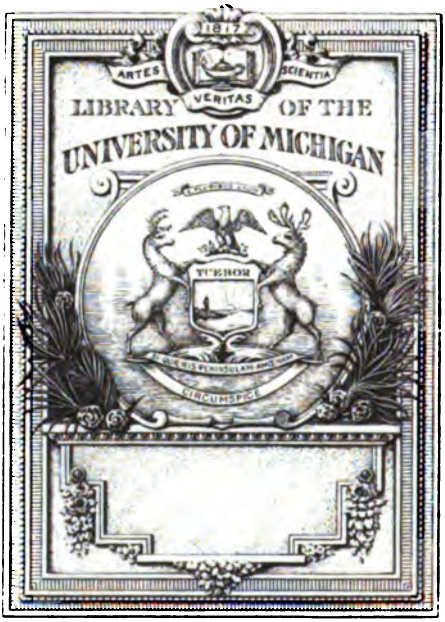

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ONE HUNDRED AND THIRTY-NINTH SESSION

1916

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STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

TWENTY-THIRD ANNUAL REPORT

OF THE

Department of Agriculture

For the Year Ending September 30, 1915

PART III

TRANSMITTED TO THE LEGISLATURE JANUARY 15, 1916

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1916

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STATE OF NEW YORK

No. 21

IN SENATE

JANUARY 15, 1916

TWENTY-THIRD ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

PART III

To the Honorable the Legislature of the State of New York:

In accordance with the provisions of the statutes relating thereto, I have the honor to transmit herewith the Twenty-third Annual Report of the Department of Agriculture of the State of New York, for the year ending September 30 1915

CHARLES S. WILSON
Commissioner of Agriculture

January 15, 1916.

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STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

CALVIN J. HUSON, Commissioner

Bulletin 69

List of Butter and Cheese Factories, Milk Stations and Condensing Plants in New York State

Including list of Milk dealers licensed for year ending
September 1, 1915

BUTTER AND CHEESE FACTORIES, MILK STATIONS AND CONDENSING PLANTS IN NEW YORK STATE

Key to Abbreviations

B. = Butter Factory.
C. = Cheese Factory.
B. & C. = Butter and Cheese Factory.
M. S. = Milk Station.
Cond. = Condensing Plant.
Sk. Sta. = Skimming Station.

ALBANY COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Alcove Creamery, B	Alcove, N. Y	J. Powell.
Basic Valley Creamery, B	Westerlo, N. Y	C. P. Stevens, 124, 126 Jay st. Albany, N. Y.
Berne Creamery, B	Berne, N. Y	James A. Wright.
Feura Bush Elgin Creamery, B	Feura Bush, N. Y	Geo. Rothaupt.
Medusa Creamery, B	Medusa, N. Y	W. G. Wright.
Potter Hollow Creamery, B	Potter Hollow, N. Y	A. S. Coon, Preston Hollow.
Preston House, Sk. Sta	Preston Hollow, N. Y	A. S. Coon, Preston Hollow.
Rensselaerville Creamery, B	Rensselaerville, N. Y	H. H. Bates.
South Berne, Sk. Sta	South Berne, N. Y	C. P. Stevens, 124, 126 Jay st., Albany, N. Y.
South Westerlo Elgin Creamery, B.	South Westerlo, N. Y	S. B. Palmer.

ALLEGANY COUNTY

Allen Factory, C	Caneadea, N. Y	J. A. Hogue & Son, Angelica, N. Y.
Andover Condensery, Cond	Andover, N. Y	Brown & Bailey.
Angelica Factory, C	Angelica, N. Y	J. A. Hogue & Son.
Belfast, M. S	Belfast, N. Y	Fillmore Belfast Dairy Products Co., Fillmore, N. Y.
Belfast, C	Belfast, N Y	F. B. D. P. Co., Fillmore, N. Y.
Brookside, Factory, C	Houghton, R. F. D., N. Y.	M. E. Gordon, Fillmore, N. Y.
Caneadea Factory, C	Caneadea, N. Y	F. B. D. P. Co., Fillmore, N. Y.
Centerville, M. S	Centerville, N. Y	F. B. D. P. Co., Fillmore, N. Y.
Crawford Creek Factory, C	Caneadea, R. F. D. 2, N.Y.	James F. Murdough.
Cryder Creek Factory, C	Whitesville, N. Y	F. B. Boyce, Wellsville, N. Y.
East Grove Factory, C	Whitneys Crossing, N. Y.	H. H. Lockwood.
Fillmore Condensery, Cond	Fillmore, N. Y	F. B. D. P. Co., Fillmore, N. Y.
Fink Hollow Factory, C	Angelica, N. Y	Ess & Closser.
Five Corners Factory, C	Almond, N. Y	E. E. Potter.
Forest Cheese Factory, C	West Clarksville, N. Y	M. M. Congdon.
Hardy Factory, C	Cuba, N. Y	C. E. Pettit, R. F. D. No. 5.
Houghton Factory, C	Houghton, N. Y	F. B. D. P. Co., Fillmore, N. Y.
Hume, C	Fillmore, N. Y	F. B. D. P. Co., Fillmore, N. Y.
Karr Valley Factory, C	Almond, N. Y	D. C. Brasted.
Keller Hill Factory, C	Cuba, N. Y., R. F. D. 3	E. S. Moses.
Kelloggville Factory, C	Rushford, N. Y., R. F. D	F. W. Hogue, Cuba, N. Y.
Lafferty Factory, C	Cuba, N. Y., R. F. D	W. N. Pettit.

ALLEGANY COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Little Genesee Factory, C.........	Little Genesee, N. Y.....	J. E. Case, Turtle Point, Pa.
McGrawville Factory, C..........	Black Creek, N. Y.......	F. W. Hogg, Cuba, N. Y.
Mills Mills, M. S................	Fillmore, N. Y..........	F. B. D. P. Co.
Mt. Munroe Factory, C..........	Cuba, N. Y., R. F. D.....	F. W. Hogg, Cuba, N. Y.
New Empire Factory, C..........	Angelica, N. Y..........	Alonzo N. Hunt.
New Hudson Center Factory, C...	Black Creek, N. Y., R. F. D................	Geo. Sowersby.
Nile Factory, C.................	Nile, N. Y..............	Henry Wyant,
Oramel Factory, C...............	Oramel, N. Y...........	F. B. D. P. Co., Fillmore, N. Y.
Phillips Creek Factory, C.........	Belmont, N. Y., R. F. D..	J. A. Hogue & J. L. Ives, Angelica, N. Y.
Quavale Factory, C..............	Friendship, N. Y., R. F. D	B. C. Pierce.
Rawson Factory, C..............	Cuba, N. Y., R. F. D....	F. W. Hogue.
Richburg Factory, C.............	Richburg, N. Y.........	W. O. Saunders
Rockville, M. S.................	Belfast, N. Y...........	F. B. D. P. Co., Fillmore, N. Y.
Rushcreek, C..................	Fillmore, N. Y..........	F. B. D. P. Co. Fillmore, N. Y.
Rushford Cheese Factory, C......	Rushford, N. Y.........	F. W. Hogue, Cuba, N. Y.
Short Tract Factory, C...........	Fillmore, N. Y..........	F. B. D. P. Co. Fillmore, N. Y
Shongo Factory, C..............	Fillmore, N. Y..........	F. B. D. P. Co. Fillmore, N. Y.
Slav Factory, C.................	Fillmore, N. Y., R. F. D..	F. W. Hogue, Cuba, N. Y.
South Cuba Factory, C..........	Cuba, N. Y............	E. S. Moses, R. F. D. 3.
South Eagle Factory, C..........	Bliss, N. Y.............	F. W. Hogg, Cuba, N. Y.
South Valley Factory, C..........	Canaseraga, N. Y........	Mrs. Mary Moore.
Stone Springs Factory, C.........	Fillmore, N. Y..........	F. B. D. P. Co.
Stone Spring, M. S..............	Fillmore, N. Y..........	F. B. D. P. Co., Fillmore, N. Y.
West Branch Factory, C..........	Farmersville, N. Y., R. F. D. 1................	F. W. James.
West Clarksville Factory, C.......	West Clarksville, N. Y...	M. Congdon.
West Hill Factory, C............	Caneadea, N. Y.........	F. W. Hogue, Cuba, N. Y.
West Nile Factory, C............	Friendship, N. Y........	Henry Wyant.
Wilson Farm Factory, C..........	Black Creek, N. Y.......	E. S. Moses, Cuba, N. Y., R. F. D. 3.
Wiscoy Factory, C...............	Wiscoy, N. Y...........	F. B. D. P. Co., Fillmore, N. Y.
Withey Factory, C...............	Belmont, N. Y..........	Ward Kams, R. F. D.
Wirt Center Factory, C..........	Nile, N. Y..............	Henry Wyant.

BROOME COUNTY

Barker, M. S....................	Itaska, N. Y............	Hudson Milk & Cream Co., 120 Magnolia ave., Jersey City, N. J.
Barnum, M. S...................	Lestershire, N. Y........	Chas. W. Barnum, 130 Main st.
Borden's, M. S..................	Center Lisle, N. Y.......	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S..................	Deposit, N. Y...........	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S..................	Endicott, N. Y..........	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S..................	Harpursville, N. Y......	Borden's Condensed Milk Co., 108 Hudson st., New York City.

BROOME COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Borden's, M. S	Lisle, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Tunnel, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Whitneys Point, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Broome Co. Dairy Co., M. S	Binghamton, N. Y	Broome County Dairy Co., 98 Washington st.
Center Lisle High Ground, M. S	Center Lisle, N. Y	High Ground Dairy Co., 443 Madison st., Brooklyn, N. Y.
Chadwick, M. S	Binghamton, N. Y	Chas. E. Chadwick, 239 Vestal ave.
Cloverdale Farms, M. S	Binghamton, N. Y	Cloverdale Farms Creamery Co., 60 Exchange st.
Cloughs Corners Factory, B. & C	Whitney Point, N. Y	F. W. Janssen, 316 Garden st., Hoboken, N. J.
Deposit Mutual Co., M. S	Deposit, N. Y	Mutual Milk & Cream Co., 214 East 22d st., New York City.
Endicott Creamery Co., M. S	Endicott, N. Y	Harvey E. Morgan, 103 Madison ave.
Gulf Summit, M. S	Gulf Summit, N. Y	Alex. Campbell Milk Co., 802 Fulton st., Brooklyn, N. Y.
Guernsey Dairy, M. S	Binghamton, N. Y	Scott & Thomas, 95 Front st.
Hall, M. S	Binghamton, N. Y	J. D. Hodgkin, 33 Court st.
Jones, M. S	Binghamton, N. Y	L. W. Jones, 494 North Chenango st.
Killawog, M. S	Killawog, N. Y	C. G. Stretch.
Kirkwood, M. S	Kirkwood, N. Y	New York Dairy Produce Co. Greenwich st., Brooklyn, N. Y.
Langdon, M. S	Kirkwood, N. Y	Alex. Campbell Milk Co., 802 Fulton st., Brooklyn, N. Y.
Lee Bros., M. S	Binghamton, N. Y	Lee Bros., 37 Winding Way.
Lisle High Ground, M. S	Lisle, N. Y	High Ground Dairy Co., 447 Madison st., Brooklyn, N. Y.
Maine Factory, B	Maine, N. Y	Kinne Bros., 247 Water st., Binghamton, N. Y.
Mattoon, M. S	Endicott, N. Y	L. S. Mattoon, 14–16 Washington ave.
McClure, M. S	McClure, N. Y	Ideal Dairy Co., 203 20th st., Brooklyn, N. Y.
McNamara & Hickey, M. S	Binghamton, N. Y	McNamara & Hickey, 238½ Clinton st.
Nanticoke Factory, B	Nanticoke, N. Y	Kinne Bros., 247 Water st., Binghamton, N. Y.
North Fenton, M. S	Chenango Forks, N. Y., R. D	Broome County Dairy Co., 98 Washington st., Binghamton, N. Y.
Ouaquaga Factory, C	Ouaquaga, N. Y	W. J. Peach, Pulaski, N. Y.
Robinson, M. S	Binghamton, N. Y	W. S. Robinson, 22 Edwards st.
Sanataria Springs, M. S	Sanataria Springs, N. Y	Broome County Dairy Co., 98 Washington st., Binghamton, N. Y.

BROOME COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Sanford Factory, B	Sanford, N. Y	C. D. Eldred.
Schoonover, M. S	Lestershire, N. Y	W. L. Schoonover, 59 Broad st.
S. F. S. D. Co., M. S	Center Village, N. Y	Sheffield Farms Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Conklin, N. Y	Sheffield Farms Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	East Windsor, N. Y	Sheffield Farms Slawson Decker Co., 524 West 57th st., New York City.
Triangle Factory, B. & C	Triangle, N. Y	F. W. Janssen, 316 Garden st., Hoboken, N. J.
Tunnel, M. S	Tunnel, N. Y	R. F. Stevens Co., 8894 Third ave., Brooklyn, N. Y.
Tunnel Factory, C	Tunnel, N. Y	Villecco Vito.
Tupper, M. S	Lestershire, N. Y	Frank A. Tupper, 147 Corliss ave.
Union Center Factory, B	Union Center, N. Y	Broome County Dairy Co., 98 Washington st., Binghamton, N. Y.
Vallonia Factory, B	Nineveh, N. Y	Brown & Root Co., 167 Read st., New York City.
Windsor, M. S	Windsor, N. Y	Empire State Dairy Co., 502 Broadway, Brooklyn, N. Y.
Janssen, M. S	Whitney Point, N. Y	F. W. Janssen, 316 Garden st., Hoboken, N. J.

CATTARAUGUS COUNTY

Abbott's Union Factory, C	Cuba, N. Y., R. F. D. 4	Orson Roat.
Ashford Factory, C	West Valley, N. Y	C. D. Bond, Springville, N. Y., R. D.
Bellows Factory, C	West Valley, N. Y	I. B. Niff.
Borden's, M. S	Randolph, N. Y	O. H. Stevens, Supt., Ellicottville, N. Y.
Broadway Factory, C	Gowanda, N. Y	J. F. Hauser.
Bucktorth Union Factory, C	Little Valley, N. Y	F. A. Reeves, West Salamanca, N. Y.
Bullock Factory, C	Franklinville, N. Y	Geo. E. Hogue, Arcade, N. Y.
Cattaraugus, M. S	Cattaraugus, N. Y	Queen City Dairy Co., 251 Seneca st., Buffalo, N. Y.
Cottage Factory, C	South Dayton, N. Y	H. S. Sweetland.
Eagle Factory, C	East Otto, N. Y	Gibby & Evans, Cattaraugus, N. Y.
East Factory, C	East Otto, N. Y	Gibby & Evans, Cattaraugus, N. Y.
East Otto Factory, C	East Otto, N. Y	Gibby & Evans, Cattaraugus, N. Y.
East Valley Factory, C	Ellicottville, N. Y	G. C. Wulff.
East Valley No. 2, C	Ellicottville, N. Y	G. C. Wulff.
Empire Factory, C	Cattaraugus, N. Y	J. P. Girst.
Farmersville Center Factory, C	Farmersville Sta., N. Y	Geo. E. Hogue, Arcade, N. Y.
Farmersville Sta. Factory, C	Farmersville Sta. N. Y	Geo. E. Hogue, Arcade, N. Y.
Five Mill Union Factory, C	Allegany, N. Y	John L. Schmidt.
Four Mill Union Factory, C	Allegany, N. Y	H. F. Martiny.

CATTARAUGUS COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Franklinville No. 4 Factory, C	Great Valley, N. Y., R. F. D.	W. L. Hogue & Son, Hinsdale, N. Y.
Franklinville No. 6 Factory, C	Humphrey Center, N. Y.	W. L. Hogue & Son, Hinsdale, N. Y.
Franklinville No. 7 Factory, C	Allegany, N. Y., R. F. D.	W. L. Hogue & Son, Hinsdale, N. Y.
Franklinville No. 15 Factory, C	Allegany, N. Y., R. F. D.	W. L. Hogue & Son., Hinsdale, N. Y.
Franklinville No. 16 Factory, C	Franklinville, N. Y.	W. L. Hogue & Son, Hinsdale, N. Y.
Franktown Factory, C	Springville, N. Y.	C. D. Bond.
Glen Brook No. 2 Factory, C	Great Valley, N. Y.	Great Valley Cheese Factory Co.
Glen Brook No. 3 Factory, C	Great Valley, N. Y.	Great Valley Cheese Factory Co
Haskall Factory, C	Cuba, N. Y., R. F. D.	F. W. Hogue, Cuba, N. Y.
Hasselbech Co., No. 16, C	Springville, N. Y., R. F. D.	Hasselbech Cheese Co., 596–600 Jefferson st., Buffalo, N. Y.
Hasselbech Co., No. 20, C	West Valley, N. Y., R. F. D.	Hasselbech Cheese Co., 596–600 Jefferson st., Buffalo, N. Y.
Hinman Valley Factory, C	Ellicottville, N. Y.	M. Jenkel, Ellicottville, N. Y.
Ischua, C	Ischua, N. Y.	W. L. Hogue & Son, Hinsdale, N. Y.
Klens Factory, C	Otto, N. Y.	W. H. Klens, Cattaraugus, N. Y.
Laidlau Factory, C	Franklinville, N. Y.	Geo. E. Hogue, Arcade, N. Y.
Lebanon Cheese Factory, C	Randolph, N. Y., R. F. D.	H. C. Peaslee.
Leon, M. S	Leon, N. Y.	A. G. Hoefler, Buffalo, N. Y.
Lime Brook Factory, C	Otto, N. Y.	P. F. Jark.
Lime Lake, M. S	Lime Lake, N. Y.	Queen City Dairy Co., 251 Seneca st., Buffalo, N. Y.
Limestone Factory, C	Limestone, N. Y.	B. Bissell.
Little Valley Powder Plant, M. S.	Little Plant, N. Y.	Merrell-Soule Co., Syracuse, N. Y.
Lyndon Factory, C	Franklinville, N. Y.	E. N. Case.
Markhams, M. S	South Dayton, N. Y.	Queen City Dairy Co., 251 Seneca st., Buffalo, N. Y.
Marble Springs Factory, C	Delevan, N. Y.	Geo. Hogue, Arcade, N. Y.
Maple Grove Cheese Factory, C	Sandusky, N. Y.	Geo. E. Hogue, Arcade, N. Y.
Markhams Union Factory, C	South Dayton, N. Y.	J. P. Zanger.
Maynard's Factory, C	East Otto, N. Y.	Gibby & Evans, Cattaraugus, N. Y.
Nine Mile Union Factory, C	Allegany, N. Y.	Leonard S. Fish.
North Otto Factory, C	Gowanda, N. Y., R. F. D.	Gibby & Evans, Cattaraugus, N. Y.
North Perrysburg Factory, C	Perrysburg, N. Y.	North Perrysburg Dairy Association.
Onoville Factory, B	Onoville, N. Y.	Fred Seitz, Mgr.
Perrysburg Factory, C	Perrysburg, N. Y.	H. S. Sweetland, South Dayton, N. Y.
Plato Factory, C	Ellicottville, N. Y.	John H. Wulff.
Randolph No. 2, C	Randolph, N. Y.	Carpenter Bros.
Red House, C	Red House, N. Y.	Eugene Whaley.
Ross Factory, No. 2, C	Gowanda, N. Y.	E. P. Ross.

CATTARAUGUS COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Scott's Corners Factory, C	East Otto, N. Y	Gibby & Evans, Cattaraugus, N. Y.
S. F. S. D. Co., M. S	Franklinville, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City, N. Y.
S. F. S. D. Co., M. S	Ischua, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City, N. Y.
S. F. S. D. Co., M. S	Ischua, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Spring Brook, No. 1, C	New Albion, N. Y	C. J. Buskist, Cattaraugus, N. Y.
Spring Brook, No. 2, C	Gowanda, N. Y	Henry J. Gold.
Spring Brook, No. 5, C	Little Valley, N. Y	C. J. Buskist, Cattaraugus, N. Y.
Veder Corners, C		John H. Wulff.
West Valley Factory, C	West Valley, N. Y	Bohner & Seubert, 821 Genesee st., Buffalo, N. Y.
Wright No. 8 Factory, C	Great Valley, N. Y	W. L. Hogue, Hinsdale, N. Y.
	CAYUGA COUNTY	
Greenfield Factory C	Moravia, N. Y	Roscoe C. Coon.
Morse Mill, Skm. Sta	Moravia, N. Y	Wm. M. Murrp & Co., Moravia, N. Y.
Muckey Factory No. 1, The B. & C.	Sterling Station, R. D. 57.	D. C. Muckey.
Muckey Factory No. 2, The B. & C.	Sterling Station, R. D. 2.	D. C. Muckey.
Spring Lake, Skm. Sta	Spring Lake, N. Y	William E. Hall, South Butler, N. Y.
	CHAUTAUQUA COUNTY	
Aldrich, C	Fredonia, R. F. D., N. Y.	A. Aldrich.
Arkwright Center Factory, C	Fredonia, N. Y	F. W. Horton.
Arkwright Union Factory, C	Cassadaga, N. Y	W. C. Ridoret.
Balcolm Factory, C	South Dayton	D. D. Decker.
Beardsley Factory, C	South Dayton, N Y	H. S. Sweetland.
Bemus Point Factory, C	Bemus Point, N. Y	J. B. Kelly.
Cassadaga Ice Cream Co., B	Burnhams, N. Y	Cassadaga Ice Cream & Butter Co.
Centralia Factory, C	Sinclairville, N. Y., R. F. D. 41	W. H. Bates.
Chautauqua Factory, B	Mayville, N. Y	F. M. Thomas.
Charlotte Union Factory, C	Sinclairville, N. Y	E. F. Lake.
Chautauqua, M. S	Chautauqua, N. Y	W. R. Petitt.
Chautauqua Lake Factory, B	Mayville, N. Y	F. M. Thomas.
Dean Factory, C	Mayville, N. Y	W. Gampp.
Ellington Factory, C	Ellington, N.Y	W. J. Boberg.
Empire Factory, C	Forestville, N. Y	H. S. Sweetland, South Dayton, N. Y.
Frewsbury, M. S	Frewsbury, N. Y	Merrell-Soule Co., Syracuse, N. Y.
Hamlet Factory, C	Hamlet, N. Y	H. S. Sweetland, South Dayton, N. Y.
Hartfield Factory, C	Mayville, N. Y	F. L. Ellison.
Linwood Factory, C	Cherry Creek, N. Y	H. S. Sweetland, South Dayton, N. Y.
Levant Factory, B	Falconer, N. Y	L. A. Perce.
Maple Grove Factory, B	Mayville, N. Y	Dwight E. Morris.
Moons Factory, C	Moons, N. Y	Mrs. I. N. Gamp.

CHAUTAUQUA COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Nashville Factory, C	Forestville, N. Y	H. S. Sweetland, South Dayton N. Y.
Orchard Park Factory, C	Falconer, N. Y	Sidney Wakefield.
Road Factory, C	Sinclairville, N. Y	A. J. Road.
Ross Valley Factory, B	Falconer, N. Y	J. D. Luce.
Ruttenbur Factory, C	South Dayton, N. Y	John L. Ruttenbur.
Sherman, M. S	Sherman, N. Y	Mohawk Milk Co., New York City.
South Pomfret Factory, C	Fredonia, N. Y	A. L. Aldrich.
Spring Valley Factory, C	Cherry Creek, N. Y	Chas. L. Frost.
Stockton Factory, C	Stockton, N. Y	I. A. Gampp.
The Supplee Alderney Dairy, M. S.	Summerdale, N. Y	The Supplee Alderney Dairy, 1118 Jefferson st., Philadelphia, Pa.
The Supplee Alderney Dairy, M. S.	Mayville, N. Y	The Supplee Alderney Dairy, 1118 Jefferson st., Philadelphia Pa.
Villenore Factory, C	South Dayton, N. Y	H. S. Sweetland.
Warnock Factory, C	DeWittville, N. Y., R. D. 40	Thos. Warnock.
Warner Factory, C	Sinclairville, N. Y	H. S. Sweetland, South Dayton

CHEMUNG COUNTY

Atwater Bros. Factory, B	Elmira, N. Y	Frank D. and Floyd A. Atwater. 401 Division st., Elmira, N. Y.
Big Flats, M. S	Big Flats, N. Y	P. Kniskern.
Breesport, M. S	Elmira, N. Y	Atwater Bros., 401 Division st.
Chemung Valley Cond. Co., Cond	Ashland, N. Y	A. C. Wright, Wellsburg, N. Y.
Horseheads Co., Cry	Horseheads, N. Y	O. D. Essenhart.
Royal Dairy Co., B	Elmira, N. Y	H. A. Prechtl, 665 Lake st.

CHENANGO COUNTY

Afton Milk Station, M. S	Afton, N. Y	L. L. Campbell, 4034 West 48th st., New York City.
Borden's Milk Station, M. S	Afton, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Bainbridge Milk Station, M. S	Bainbridge, N. Y	Bainbridge Milk Co., Inc., 108 Hudson st., New York City.
Bainbridge National Milk Sugar Co., M. S	Bainbridge, N. Y	National Milk Sugar Co.
Bainbridge Supplee Milk Station,	Bainbridge, N. Y	The Supplee Alderney Dairy, 1118 Jefferson st., Philadelphia, Pa.
Bainbridge Sheffield, M. S	Bainbridge, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Bonney Milk Station, M. S	Bonney, N. Y	The Cohen Dairy Co., 60 Lenox ave., New York City.
Brisbin Milk Station, M. S	Brisbin, N. Y	Borden Condensed Milk Co., 108 Hudson st., New York City.
Coventry Cheese Factory, C	Coventry, N. Y	The Supplee Alderney Dairy, 1118 Jefferson st., Philadelphia, Pa.

CHENANGO COUNTY —.(*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Columbus Milk Station, M. S.	New Berlin, R. F. D.	Phenix Cheese Co., South Edmeston, N. Y.
Cottage Cheese Factory, C.	Sherburne, N. Y.	Wm. Casey.
Coventryville, Butter & Cheese Co., B. & C.	Coventry, N. Y.	A. B. McMasters, Coventryville, N. Y.
Den Spring Cheese Factory, C.	Oxford, R. D. 1, N. Y.	S. C. Stiler.
East Pharsalia, Factory, B. & C.	East Pharsalia, N. Y.	Geo. H. Hall.
Earlville Borden Milk Station, M. S.	Earlville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
East Guilfoil Platform, M. S.	East Guilfoil, N. Y.	Rockdale Creamery Co., Rockdale, N. Y.
Earlville Baldwin's Milk Station, M. S.	Earlville, N. Y., R. D.	F. N. Janssen, 316 Garden st., Hoboken, N. J.
Ekenberg Butter & Cheese Factory, B. & C.	South Otselic, N. Y.	Ekenberg Co., Cortland, N. Y.
Falena Milk Station, M. S.	Norwich, N. Y.	Otto Fruhn, 221, 223 Boerum, st., Brooklyn.
German Butter & Cheese Factory, B. & C.	Cincinnatus, N. Y.. R. D.	John Forshee, Willet, N. Y.
Greene Milk Station, M. S.	Greene, N. Y.	Empire State Dairy Co., 502 Broadway, Brooklyn, N. Y.
Guilfoil Milk Station, M. S.	Guilfoil, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Haynes Milk Station, M. S.	Oxford, N. Y. R. D. 4	I. W. Rushmon, 100 Atlantic ave., Brooklyn.
Harbor Cheese Factory, C.	Greene, N. Y. R. D. 1	Harbor Creamery Co.
Heuer Milk Station, M. S.	Earlville, N. Y.	Otto Heuer, Union Hill, N. J.
Hillside Cheese Factory, C.	Sherburne, N. Y.	A. T. Gahan,
Holmesville, Platform, M. S.	Holmesville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Kirkdale Butter & Cheese Factory, B. & C.	Plymouth, N. Y.	H. E. Huntley, South Plymouth, N. Y.
Lincklaen Butter & Cheese Factory, B. & C.	Lincklaen, N. Y.	N. M. Pforter.
Lyon Brook & Starr Butter & Cheese Factory, B. & C.	Norwich, N. Y.	O. P. Phettplace & Co.
Maple Grove Cheese Factory, C.	Smithville, Flats	Maple Grove Creamery Co.
McDonough Elgin Butter Factory, B.	McDonough, N. Y.	McDonough Elgin Creamery Co
New Berlin Milk Station, M. S.	New Berlin, N. Y.	Leroy Dairy Co., 520 Avenue A, New York City.
Nineveh Junction Milk Station, M. S.	Nineveh Junction, N. Y.	I. Lieber, 4 and 6 East 110th st.. New York City.
North Pitcher Cheese Factory, C.	North Pitcher, N. Y.	M. A. Newton.
Norwich Milk Station, M. S.	Norwich, N. Y.	I. W. Rushmore Co., 100 Atlantic ave., Brooklyn, N. Y.

CHENANGO COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Norwich Milk Station, M. S.	Norwich, N. Y.	H. A. & J. L. Millspaugh.
North Pharsalia Cheese Factory, C.	North Pharsalia, N. Y.	Al. Franklin.
Norwich Condensery, Con.	Norwich, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Otselic Center Butter & Cheese Factory, B. & C.	Otselic, N. Y.	B. Fred Saunders, Georgetown.
Otselic Butter & Cheese Factory, B. & C.	Otselic, N. Y.	L. G. Lane.
Oxford Milk Station, M. S.	Oxford, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Parker Milk Station, M. S.	Parker, N. Y.	Wm. Jordan, 408 Cleveland place, Union Hill, N. J.
Pitcher Butter & Cheese Factory, B. & C.	Pitcher, N. Y.	B. F. Kellough, Cincinnatus, N. Y.
Pharsalia Hook Butter & Cheese Factory, B. & C.	Pharsalia, N. Y.	Randolph Hibbard.
Plymouth Butter & Cheese Factory, B. & C.	Plymouth, N. Y.	G. W. Shoales.
Rockdale, Milk Station, M. S.	Rockdale, N. Y.	Rockdale Creamery Co.
Shamrock & Thistle Cheese Factory, C.	Plymouth, N. Y.	B. L. Gibson.
Sherburne, M. S.	Sherburne, N. Y.	Standard Dairy Co., 611, 613 East 12th st., New York City.
Sherburne Four Corners, M. S.	Sherburne, N. Y.	Standard Dairy Co., 611, 613 East 12th st., New York City.
Smithville, Center Cheese Factory, C.	Greene, R. D. 1., N. Y.	William Adams.
South Otselic B. & C. Factory,	South Otselic, N. Y.	J. E. Japhet.
South New Berlin Milk Station, M. S.	South New Berlin, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Stillwater Milk Station, M. S.	Greene, N. Y.	F. W. Janssen, 316 Garden st., Hoboken, N. J.
Smyrna Milk Station, M. S.	Smyrna, N. Y.	McDermott Dairy Co., 91–97 Manhattan st., New York City.
Smithville Flats Milk Station, M. S.	Smithville, Flats, N. Y.	Empire State Dairy Co., 506 Broadway, Brooklyn, N. Y.
Tarbell Farms, B.	Smithville, Flats, N. Y.	G. E. Tarbell, Garden City, N. Y.
Trestle Milk Station, M. S.	Guilford, N. Y.	Wm. Jordan, 408 Cleveland place, Union Hill, N. J.
Union Valley Factory, B. & C.	Union Valley, N. Y.	Dana S. White.
Willards, M. S.	Chenango Forks, N. Y.	Otto Grulm, 221, 223 Boerum st.
Woods Crossing, M. S.	Norwich, N. Y.	High Grounds Dairy Co., 447 Madison st., New York City.

CLINTON COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Altona, M. S. & C.		Tietjen Bros., 506–508 East 118th st., New York City.
Carmon Creamery, B.	Mooers Forks, N. Y.	H. R. Tate, Mgr.
Chazy, B.	Plattsburg, N. Y.	Boomhower Grocery Co.

CLINTON COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Churubusco, M. S.	Churubusco, N. Y.	E. Shoemaker, New York City.
Clark Farm Creamery, B.	Peru, N. Y.	Datus Clark.
Clinton Creamery, B.	Frontier, N. Y.	F. P. O'Neil.
Clinton Mills, M. S.	Clinton Mills, N. Y.	J. H. Wembe, 678 East 133d st., New York City.
Clover Leaf Creamery, B.	Ellenburg Depot, N. Y.	T. B. Humphrey, Churubusco, N. Y.
Clover Leaf Creamery, B.	Morrisville, N. Y.	James Murray, Mgr.
Crystal Spring Creamery, B.	West Chazy, N. Y.	David F. Rooney.
Crystal Spring Creamery, B.	Ellenburg Depot, N. Y.	Haughran & Myers.
Disco Creamery, B.	Disco, N. Y.	Peru Butter & Cheese Co., Peru, N. Y.
Dunn Farm Creamery, B.	Chazy, N. Y.	Seth Gordon.
Forest Milk Station, M. S.	Forest, N. Y.	S. B. Bacon.
Harkness Creamery, B. & Cream.	Harkness, N. Y.	Peru Butter & Cheese Co., Peru, N. Y.
Highland Creamery, B.	Churubusco, N. Y.	Wm. Nichols.
Irona Creamery, B.	Irona, N. Y.	Trombly Bros., Altona, N. Y.
Lake Side Creamery, B.	Plattsburg, R. F. D. 2.	Chellis Bros.
Maple Grove Creamery, B.	Ellenburg Center	O. B. Frasier.
Marble River Creamery, B. & C.	Churubusco, N. Y.	Marble River Creamery Co.
Mooers Forks Creamery, B. & C.	Mooers Forks, N. Y.	N. M. Marshall.
Mooers Jct. Milk Station, M. S.	Mooers Junction, N. Y.	Thos. F. Dickinson.
Mutual Milk & Cream Co., M. S.	Champlain, N. Y.	Mutual Milk & Cream Co., 214 East 22d st., New York City.
Mutual Milk & Cream Co., C.	Ellenburg, N. Y.	Mutual Milk & Cream Co., 214 East 22d st., New York City.
New England Creamery Co., M. S.	Plattsburg, N. Y.	Hartwell Bros., Cor. Cornelia & Miller sts.
Peasliville Creamery, B.	Plattsburg, N. Y.	Boomhower Grocery Co.
Peru Cheese Factory, B. & C.	Peru, N. Y.	Peru Butter & Cheese Co.
Plattsburg Creamery, B. & C.	Plattsburg, N. Y.	Boomhower Grocery Co.
Riverview Creamery, B.	Champlain, N. Y.	Leon H. Wiley.
Rockside Creamery, B.	Altona, N. Y.	Trombley Bros.
Silver Spring Creamery, B.	West Chazy, N. Y.	E. H. Goewey.
South Ellenburg Creamery Co., B.	Ellenburg Center, N. Y.	J. G. Haig.
Smithdale Creamery, B.	Plattsburg, N. Y.	Boomhower Grocery Co.
Valley Springs Creamery, B. & C.	Churubusco, N. Y.	T. B. Humphrey.
West Beekmantown Creamery Association, B.	West Chazy, R. F. D. 3.	W. W. Comstock.
West Hill Cooperative Creamery, B.	Chateaugay, N. Y.	John Hogan.
West Plattsburg Creamery, B.	Plattsburg, N. Y.	Boomhower Grocery Co.
Willow Brook, B.	Ellenburg Center, N. Y.	A. Lodombard.
Saranac Valley Creamery, B.	Cadyville, R. F. D. 2.	W. J. Roach, Mgr.

COLUMBIA COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Borden's M. S.	Ancram Lead Mines, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Chatham, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.

COLUMBIA COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Borden's, M. S.	Copake, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Craryville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Mellenville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Old Chatham, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Elizaville, M. S.	Pine Plains, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Harlemville Creamery, B.	Ghent, N. Y., R. D.	F. A. Doolittle.
Homestead Farm Creamery, B.	Lebanon Centre, N. Y.	A. S. & A. D. Height.
Italian Creamery, C.	East Chatham, N. Y.	G. Savarese & Son, 386, 390 Commercial st., Boston, Mass
Livingston Cooperative Creamery, B.	Livingston, N. Y.	Jesse L. Rowe.
North Chatham, M. S.	North Chatham, N. Y.	Locust Farm Co., New York City.
S. F. S. D., M. S.	Boston Corners, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 52d st., New York City.
S. F. S. D., M. S.	Hillsdale, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 52d st., New York City.
Spencertown Cooperative Creamery, B.	Spencertown, N. Y.	E. A. Chase.
Stuyvesant Falls, M. S.	Stuyvesant Falls, N. Y.	Locust Farms Co., New York City.

CORTLAND COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Blodgett's Mills, M. S.	Blodgett's Mills, N. Y.	John Bosch's Sons, 163 Ellery st. Brooklyn, N. Y.
Blodgett's Mills, M. S.	Blodgett's Mills, N. Y.	R. C. Greten, 214 Grand st., Hoboken, N. J.
Brookside Factory, C.	Marathon, N. Y.	Lorenzo Conrad.
Cincinnatus Condensery, Cond.	Cincinnatus, N. Y.	Cincinnatus Dairy Co.
Cincinnatus, M. S.	Cincinnatus, N. Y.	Reed Ice Cream Co., 524 Waverly ave., Brooklyn, N. Y.
Cortland, M. S.	Cortland, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Cold Brook Factory, B. & C.	Willet, N. Y.	Merton Mathews.
Cortland Co., Central Factory, C.	McGraw, N. Y., R. F. D.	Geo. F. Davis.
Cuyler, M. S.	Cuyler, N. Y.	Standard Dairy Co., 611, 613 East 12th st., New York City.
Curtis Factory, C.	Truxton, N. Y.	Albert Curtis.
East Freetown, M. S.	East Freetown, N. Y.	Beakes Dairy Co., 256 East 12th st., New York City.
East Homer, M. S.	East Homer, N. Y.	Henry Rausch, 27 Garden st., Brooklyn, N. Y.

CORTLAND COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
East River, M. S.	Cortland, N. Y., R. F. D.	Model Dairy Milk & Cream Co., 246 Eighth ave., New York City.
The Ekenberg Co., M. S.	Cortland, N. Y.	The Ekenberg Co.
Freetown Corner Factory, B. & C.	Marathon, N. Y., R. F. D. 3	A. E. Doane.
Gracie, M. S.	Cortland, N. Y., R. D.	Seiler Bros., 272 Plain st., Newark, N. J.
Hartford Factory, C.	Hartford, N. Y.	John Blummers & Bros., 539 East 57th st., New York City.
Hartford Mills, M. S.	Hartford Mills, N. Y.	Modern Dairy Co., Inc., 868 Dean st., New York City.
Hartford, M. S.	Hartford, N. Y.	Standard Dairy Co., 611, 613 East 12th st., New York City.
Highland Factory, B. & C.	Marathon, N. Y., R. F. D. 2	C. G. Stretch, Killawog, N. Y.
Little York, M. S.	Little York, N. Y.	F. W. Janssen, 316 Garden st., Hoboken, N. J.
Marathon, M. S.	Marathon, N. Y.	R. F. Stevens Co., 94 Third ave., Brooklyn, N. Y.
Marathon, M. S.	Marathon, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Maybury Mills, M. S.	McGraw, N. Y.	Otto Gruhn, 221, 223 Boerum st., Brooklyn, N. Y.
McGraw, M. S.	McGraw, N. Y.	High Ground Dairy Co., 447 Madison st., Brooklyn, N. Y.
Messengerville, M. S.	Messengerville, N. Y.	Hudson Milk & Cream Co., 120 Magnolia ave., Jersey City, N. J.
Otselic Valley Factory, C.	Marathon N. Y., R. F. D. 1.	Thomas Reagan.
Preble, M. S.	Preble, N. Y.	John Bosch's Sons, 163 Ellery st., Brooklyn, N. Y.
Preble, M. S.	Preble, N. Y.	Keystone Dairy Co., 600 Madison st., Brooklyn, N. Y.
Scott Factory, C.	Homer, N. Y., R. F. D.	Scott Creamery Co.
Solon, M. S.	Solon, N. Y.	John Bosch's Sons, 163 Ellery st., Brooklyn, N. Y.
Taylor Valley Factory, B. & C.	Cincinnatus, N. Y.	Dana White.
Taylor, C.	Taylor, N. Y.	Charles Cuomo, 42 Spring st., New York City.
Taylor Center Factory, B. & C.	Cincinnatus, N. Y.	A. H. Loope.
Texas Valley Factory, B. & C.	Marathon, N. Y., R. D. 1.	A. E. Doane.
Truxton, Sheffield Farms, M. S.	Truxton, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Truxton, M. S.	Truxton, N. Y.	Levy Dairy Co., 320 Avenue A, New York City.
Wightman Factory, C.	Marathon, N. Y., R. D. 1.	Homer Wightman.
Willet Factory, B. & C.	Willet, N. Y.	Beardsley Cooperative Creamery Co.
Wheeler Factory, B. & C.	Cincinnatus, N.Y., R. D. 1.	R. G. Wheeler, 7 Wheeler ave., Cortland, N. Y.
Young's Crossing, M. S.	East Cortland, N. Y., R. F. D.	Otto Gruhn, 221, 223 Boerum st., Brooklyn, N. Y.

DELAWARE COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Andes Creamery, M. S.	Andes, N. Y.	W. O. Ostrander.
Andes Cooperative Dairy Co., B.	Andes, N. Y.	J. Alex Stott.
Ayer & McKinney, B.	Arctic, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	Bennett Hollow	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	Delaware, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	East Meredith, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	Elk Creek, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	Franklin, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	Hotaling Hollow, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	Leonta, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	Meridale, N. Y.	Ayer & McKinney.
Ayer & McKinney, B.	North Franklin, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	South Franklin, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	Treadwell, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	West Davenport, N. Y.	Ayer & McKinney, Meridale, N. Y.
Ayer & McKinney, B.	West Meredith, N. Y.	Ayer & McKinney, Meridale, N. Y.
Bartlett Hollow, M. S.	Franklin, N. Y.	E. C. Wood.
Bloomville, M. S.	Bloomville, N. Y.	W. A. Collat.
Borden's M. S.	Delhi, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., N. Y. City.
Borden's M. S.	Downsville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., N. Y. City.
Borden's M. S.	Hamden, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., N. Y. City.
Borden's M. S.	Maywood, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., N. Y. City.
Borden's M. S.	Pepacton, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., N. Y. City.
Borden's M. S.	Walton, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., N. Y. City.
Borden's M. S.	Youngs, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., N. Y. City.
Boyd & Co. Creamery, M. S.	Masonville, N. Y.	Virgil F. Boyd.
Bovina Cooperative Creamery Co., B.	Bovina, N. Y.	P. T. Miller.
Bovina Centre Cooperative Creamery Co., B.	Bovina Center, N. Y.	T. A. Archbald.
Cannonsville, B.	Cannonsville, N. Y.	B. S. Boyd & Co.
Cold Spring Creamery, B.	Roxbury, N. Y.	Fred M. Blumm.
Colchester, M. S.	Walton, N. Y., R. F. D.	James A. Barnhart.
Cooks Falls, M. S.	Cooks Falls, N. Y.	Johnson & Albee, 204 West 96th st., N. Y. City.

DELAWARE COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Delaware Valley Cooperative Creamery, B	Roxbury, N. Y	James R. Dart.
Delhi Cooperative Dairy Co., B	Delhi, N. Y	George E. Scott.
Downsville Cooperative Creamery, C	Downsville, N. Y	Breakstone Bros., 344 Greenwich st., N. Y. City.
Dunraven Cooperative Creamery, B	Dunraven, N. Y	Shavertown Creamery Co., 46 East 110th st., N. Y. City.
East Davenport, B	East Davenport, N. Y	C. Mowbray.
Elgin of the Catskills, B	Kelley's Corners, N. Y	H. S. Shultis.
Empire State Dairy Co., The, M. S.	East Meredith, N. Y	F. W. Cuyle.
Evans, W. M., Dairy Co., M. S	Beerston, N. Y	W. M. Evans Dairy Co., 32 Lexington ave., Brooklyn, N. Y.
Farmers' Cooperative Dairy Co., B	Trout Creek, N. Y	Guy McFarland.
Franklin Depot, M. S	Franklin Depot, N. Y	H. E. Johnston.
Fraser Bros., M. S	Fraser, N. Y	W. J. & H. R. Fraser.
Granton Creamery, B	Granton, N. Y	Granton Creamery Co., 84 Delaware st., Walton, N. Y.
Hamden Cooperative Creamery, B	Hamden, N. Y	Jacob C. Trylone.
Hudson Valley Dairy Co., B	New Kingston, N. Y	J. V. Jordon, Newburgh.
Kortright Creamery, B	Bloomville, N. Y	Luke Blake, 99 Sixth ave., N. Y. City.
Margaretsville, M. S	Margaretsville, N. Y	Hudson Valley Dairy Co., Newburgh, N. Y.
McDermott Dairy Co., M. S	Delancey, N. Y	Elmer B. MacDonald.
Merrickville, M. S	Merrickville, N. Y	C. E. Hallock.
Mundale Creamery, B	Walton, N. Y	Mundale Creamery Co.
New Kingston Co-op. Creamery, B.	New Kingston	W. D. Winter.
Onhout Valley Creamery, B	North Franklin, N. Y	D. J. Busse.
Pepacton Creamery Co., C	Pepactan, N. Y	Breakstone Bros., 344 Greenwich st., N. Y. City.
Phenix Cheese Co., C	Sidney, N. Y	L. E. Carpenter, 345 Greenwich st., N. Y. City.
Rockland Dairy Co., M. S	Roscoe, N. Y., R. F. D	George E. Scott.
S. F. S. D. Co., M. S	Davenport, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N. Y. City.
S. F. S. D. Co., M. S	Davenport Centre, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N Y. City.
S. F. S. D. Co., M. S	Grand Gorge, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N. Y. City.
S. F. S. D. Co., M. S	Hale Eddy, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N. Y. City.
S. F. S. D. Co., M. S	Halcottsville, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N. Y. City.
S. F. S. D. Co., M. S	Hobart, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N. Y. City.

DELAWARE COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
S. F. S. D. Co., M. S	Mickle Bridge, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N. Y. City.
S. F. S. D. Co., M. S	Roxbury, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N. Y. City.
S. F. S. D. Co., M. S	Stamford, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 52d st., N Y. City.
S. F. S. D. Co., M. S	West Harpersfield, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 52d St., N. Y. City.
South Kortright, M. S	South Kortright, N. Y	F. B. Tanner.
Treadwell Dairy Co., M. S	Treadwell, N. Y	W. H. Gibbord.
Vega Association Creamery, B	Vega, N. Y	F. F. Aroft. 37-39 Liberty st., N. Y. City.
West Brook Creamery, M. S	West Brook, N. Y	McDermott Dairy Co., 91-97 Manhattan st., N. Y. City.
West Handson Brook Creamery, B.	Franklin, N. Y., R. D. No. 1	West Handson Creamery Co., 84 Delaware st., Walton, N. Y.
West Kortright, M. S	West Kortright, N. Y	T. D. Harrington.

DUTCHESS COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Billings, M. S	Billings, N. Y	Locust Farms Co., 551 East 35th st., New York City.
Borden's, M. S	Hopewell Jct., N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Millerton, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Pine Plains, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Stanfordville, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Wassaic, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Wingdale, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Briar Cliff Farms, M. S	Pine Plains, N. Y	Geo. W. Tuttle.
Brinckerhoff, M. S	Brinckerhoff, N. Y	Hudson Valley Dairy Co., Newburgh, N. Y.
Clinton Corners, M. S	Clinton Corners, N. Y	G. M. Buckbee.
Clover Farms, M. S	Staatsburg, N. Y	W. F. Jackson.
Crowley's, M. S	Poughkeepsie, N. Y	Crowley's Dairy Products Co.
Dover Plains, M. S	Dover Plains, N. Y	McDermott Dairy Co., 91-97 Manhattan st., New York City.

DUTCHESS COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
East Fishkill, M. S	East Fishkill, N. Y	Hudson Valley Dairy Co., Newburgh, N. Y.
Fishkill Plains, M. S	Hopewell Jct., N. Y	John A. Andrews.
Green Haven, M. S	Stormville, N. Y	Central Dairy Co., 326 East 103d st., New York City.
Holmes, M. S	Holmes, N. Y	Central Dairy Co., 326 East 103d st., New York City.
La Grange Creamery, B	Arlington, N. Y	Henry R. White, 31 Marshall st., Poughkeepsie, N. Y.
La Grangeville, M. S	La Grangeville, N. Y	C. Van Cott.
McDermott Dairy Co., M. S	Millbrook, N. Y	McDermott Dairy Co., 91–97 Manhattan st., New York City.
Pleasant Valley, M. S	Pleasant Valley, N. Y	Lambert Dairy Co., 615 West 129th st., New York City.
Red Hook, M. S	Red Hook, N. Y	Geo. W. Cooper.
Salt Point, M. S	Salt Point, N. Y	R. F. Stevens Co., Third ave. and Bergen st., Brooklyn, N. Y.
Salt Point Creamery, B	Salt Point, N. Y	J. C. Foulder.
S. F. S. D. Co., M. S	Amenia, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Colemans Station, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Dover Furnace, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Patterson, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Pawling, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Sheaomeko, M. S	Sheaomeko, N. Y	Thomas McNamara.
Silver Lake Cooperative Creamery, B	Clinton Corners, N. Y	C. S. Washburn.
Stormville, M. S	Stormville, N. Y	Central Dairy Co., 326 East 103d st., New York City.
Verbank, M. S	Verbank, N. Y	Locust Farms Co., 551 East 35th st., New York City.
Wappingers Falls, M. S	Wappingers Falls, N. Y	J. K. Crowley Products Co. Arlington, N. Y.

ERIE COUNTY

Adams & Shearing Dairy Co., B. and C	Marilla, N. Y	H. W. Shearing.
Alden Dairy Co., M. S	Alden, N. Y	James M. Sparks, 146 Prospect ave., Buffalo, N. Y.
Big Four Factory, No. 2, C	Eden, R. F. D. 3, N. Y	Clayton J. Gaylord.
Borden's Condensery, Cond	Springville, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Boston Creamery, Cry	Boston, N. Y	Boston Creamery Association.

ERIE COUNTY — *(Continued)*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Buffalo Sanitary Creamery, Cry	Buffalo, N. Y	Louis Zinke, 2387 Bailey ave.
Clarence Creamery, Cry	Clarence, N. Y	Edmund & Edwin Weinange.
Clear Creek Factory, C	Collins Center, N. Y	Clark White & Son.
Clover Leaf Factory, C	North Collins, N. Y	Clover Leaf Cheese Factory Co.
Colden Creamery, Cry	Colden, N. Y	Mrs. Lula Rich.
Cole & Fish Star Creamery, Cry	East Aurora, N. Y	Bordon J. Cole, Mgr.
Colden Center, B	Glenwood, N. Y	Richardson Beebe Co., East Aurora, N. Y.
Collins Center Co., C	Collins Center, N. Y	Glenn Bolton.
Crittenden Creamery, Cry	Crittenden, N. Y	Harry L. Smith.
Dye Factory, C	Springville, N. Y	Earl E. Johnson, Forestville, N. Y.
East Concord Factory, C	East Concord, N. Y	S. D. Vance.
East Holland, Cry	Holland, N. Y	Richardson-Beebe Co., East Aurora, N. Y.
Erie Factory, C	Collins, N. Y	Frank A. Brigham.
Farmer's Favorite Factory, C	North Collins, N. Y	Peter Scheets.
Genesee Road Factory, C	Lawtons, N. Y	John A. Vance, Mgr.
Glenwood Creamery, Cry	Glenwood, N. Y	Mrs. Lula Rich, Colden, N. Y.
Hakes Bridge Factory, C	Springville, N. Y	E. L. Jones, Delevan, N. Y.
Hasselbeck Co., Factory No. 2, C	Derby, N. Y., R. F. D.	Hasselbeck Cheese Co., 596-606 Jefferson st., Buffalo, N. Y.
Hasselbeck Co., Factory, No. 13, C.	Springville, N. Y	Hasselbeck Cheese Co., 596 606 Jefferson st., Buffalo, N. Y.
Hasselbeck Co., Factory, No. 18, C.	Marilla, N. Y	Hasselbeck Cheese Co., 596-606 Jefferson st., Buffalo, N. Y.
Hasselbeck Co., Factory, No. 26, C.	Porterville, N. Y	Hasselbeck Cheese Co., 596-606 Jefferson st., Buffalo, N. Y.
Hayes Hollow Factory, C	Glenwood, N. Y	Jacob Imboden.
Holland, Cry	Holland, N. Y	Richardson-Beebe Co., East Aurora, N. Y.
Lawton's Factory, C	Lawtons N. Y	Lawton's Cheese & Milk Association, Inc.
Marshfield Factory, C	Lawtons, N. Y	John A. Vance.
Mill Grove Co., Cry	Mill Grove, N. Y	Godfrey Eukerly.
New Oregon Factory, C	Eden Center, N. Y., R. F. D. 3	John Vance, Lawtons, N. Y.
North Boston Creamery, Cry	North Boston, N. Y	Louis Fucho.
Parkside Creamery, Cry	Eden, N. Y	Parkside Creamery Co.
Peerless Creamery & Cond. Co., Cond	Akron, N. Y	Wheat Ice Cream Co., 68 Elm st. Buffalo, N. Y.
Perrin Brook Factory, C	Gowanda, N. Y., R. F. D. 1	Merritt Bull.
Pine Brook Factory, C	Gowanda, N. Y	N. B. Skuse.
Pontiac Factory, C	Angola, N. Y	Sebastian Lograsso, Brant, N. Y
Prairie Queen Factory, C	Collins Center, N. Y	Clark White & Son.
Protection, Cry	Protection, N. Y	Richardson-Beebe Co., East Aurora, N. Y.
Prairie Queen Factory, C	Collins Center, N. Y	Clark White & Son.
Queen City Dairy Co., Cry	Buffalo, N. Y	Queen City Dairy Co., 251 Seneca st., Buffalo, N. Y.
Queen City Dairy Co., Cry	East Aurora, N. Y	Queen City Dairy Co., 251 Seneca st., Buffalo, N. Y.
Queen City Dairy Co., Cry	Lawtons, N. Y	Queen City Dairy Co., 251 Seneca st., Buffalo, N. Y.

ERIE COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
South Wales, Cry	**South Wales, N. Y.**	**Richardson-Beebe Co., East Aurora, N. Y.**
Wales Center, Cry	**Wales Center, N. Y.**	**Richardson-Beebe Co., East Aurora, N. Y.**
West Boston Factory, C	**Eden, N. Y., R. F. D.**	**Catherine Wittmeyer.**
West Falls Creamery, Cry	**West Falls, N. Y.**	**C. N. Darbee.**
West Hill, B	**Holland, R. F. D., N. Y.**	**Richardson Beeb Co., East Aurora, N. Y.**
Geo. Wohlhenter Factory, C	**Colden, N. Y**	**George Wohlhenter, N. Y.**
Woodside Factory, C	**Springville, N. Y**	**G. A. Sherman.**
Wyndale Factory, C	**Springville, N. Y**	**W. F. Fatty, East Concord, N. Y.**
Zoar Factory, C	**Gowanda, R. F. D. 1**	**Henry Detmer.**

ESSEX COUNTY

Adirondack Creamery, B	**Whallonsburg, N. Y**	**T. H. Safford.**
Essex Cooperative Creamery, B	**Boquet, N. Y**	**G. A. Kelley, Essex, N. Y.**
Farmer's Cooperative Creamery, B. and C	**Crown Point, N. Y**	**W. S. Green.**
Jay Creamery, B	**Jay, N. Y**	**F. R. Wilmarth.**
Westport Creamery, B	**Westport, N. Y**	**J. H. Low.**

FRANKLIN COUNTY

Adirondack Creamery, Milk & Cream	**Bangor, N. Y**	**Franklin Co. Cry. & Cond. Milk Co., Norman Willson, Mgr.**
Alburgh Creamery, B	**Brushton, N. Y**	**S. P. & W. P. Burnap.**
Aulder Spring Creamery, B	**Chateaugay, N. Y**	**J. E. Leach.**
Bellmont Center Creamery, B	**Malone, N. Y**	**Reynolds & Chase, Brainardsville, N. Y.**
Brushton, C	**Brushton, N. Y**	**Tietjen Bros., 506 East 118th st., New York City.**
Brushton Creamery, B. & C	**Brushton, N. Y**	**F. L. Richards.**
Burnap Creamery, B	**Brushton, N. Y**	**W. P. Burnap.**
Chasm Falls or Mountain Creamery, B	**Chasm Falls, N. Y**	**I. W. Killam.**
Chateaugay, C. & M	**Chateaugay, N. Y**	**W. J. Hammond (Sheffield Farms, Slawson, Decker Co.)**
Clover Leaf Creamery, Cream	**North Bangor, N. Y**	**F. M. Aldrich.**
Cold Spring Creamery, B	**West Bangor**	**Barber & Fish.**
Columbia Creamery Co., B. & C.	**Burke, N. Y**	**F. S. Button.**
Constable Creamery, B	**Constable, N. Y**	**Wm. Stebbins.**
Crystal Spring Creamery, B	**Constable, N. Y**	**D. A. Sperry.**
East Dickinson Creamery, B. & C.	**Brushton, N. Y**	**Fred. E. Brown.**
Fay Creameries, B. (White Clover Creamery & Pioneer Creamery)	**Burke, N. Y**	**A. H. Fay,**
Fort Covington Creamery and Condensed Milk Co., B. & Cond. M	**Fort Covington, N. Y**	**O. Herrington, North Bangor, N. Y.**
Franklin County or Berry Creamery, B	**North Bangor, N. Y**	**O. Herrington.**

FRANKLIN COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Franklin Co. Creamery & Condensed Milk Co., B. & Cond. Milk	North Bangor, N. Y	O. Herrington.
Gilt Edge Creamery, B	Moira, N. Y	Stiles & Erwin.
Gold Coin Creamery Co., B	Fort Covington, N. Y	McArtney & Sperry.
Hapgood, Cream	Belmont, N. Y	J. M. Hapgood, Malone, N. Y.
Hapgood, C	Constable, N. Y.	K. H. Walbridge, Malone, N. Y.
Harwood Creamery, B	Brushton, N. Y	Chas. Erwin.
Keeler Creamery, B	Malone, N. Y	T. J. Shields.
Malone Creamery, B. & C	Malone, N Y	K. H. Walbridge.
Malone, M. S	Malone, N. Y	John D. Blume (Sheffield Farms, Slawson, Decker Co.)
Maple Creamery, B	Moira, N. Y	Jas. O'Connor.
Maple Leaf Creamery, B	North Bangor, N. Y	G. C. & C. E. Walker.
Maple Street Creamery, B	Chateaugay, N. Y., R. F D. 1	Wills Bros.
Moira, B. & M	Moira, N. Y	N. G. Hilts, Mgr., Levy Dairy Co.
Mountain Creamery, B	Whippleville, N. Y	U. W. Killam.
Mutual Milk & Cream Co., M. S.	Burke, N. Y	Mutual Milk & Cream Co., 214 East 22d st., New York City.
St. Lawrence Valley Creamery, B. (This includes Grow and Drum St. Skimmer)	Bombay, N. Y	B. D. Richardson.
St. Regis Falls Creamery, B	St. Regis Falls, N. Y	M. B. Larrabe.
St. Regis River Creamery, B	Hogansburg, N. Y	E. H. Totam.
Silver Spring Creamery, B. & C.	Brushton, N. Y., R. F. D.2	C. T. Tryon.
Sperry Creamery, M. & C	Sperry, N. Y	Norman Willson, Mgr.
Springdale Creamery, B	Dickinson Center	W. S. Martin.
Springfield Creamery. (This includes the Hutchins Skimmer), B. & C	South Bangor, N. Y	Frank B. Allen, Longmeadow, Mass.
Trout River Creamery, C	Trout River, N. Y	D. A. Sperry, Constable, N. Y.
Twin Bridge, B	Burke, N. Y	N. F. Wilson.
West Bellmont Creamery, B. & Cream	Malone, N. Y	J. M. Hapgood.
Westville Center Creamery, B. & C.	Westville Center, N. Y	C. Herrington, North Bangor, N. Y.

FULTON COUNTY

Broadalbin Creamery, B	Broadalbin, N. Y	J. T. Hughes.
Clark Lens, Creamery, B	Gloversville. N. Y	Clark Lens.
Crown Creamery, B	Johnstown, N. Y	Charles O. Cross & Sons.
Eagle Creamery	Gloversville, N. Y	E. W. Mills, 145 North Main st.
Ephratah Creamery, M. S	Ephratah, N. Y	David Watts, Fort Plain, N. Y.
Fulton County Milk Co	Johnstown, N. Y	John E. Beakle, R. F. D. 2.
Ingham Mills Dairy, C	St. Johnsville, N. Y	Ross Johnson.
Lens Creamery	Gloversville, N. Y	W. H. Lens.
Willow Creek Factory, C	Ephratah, N. Y	Allan C. Richard.

GENESEE COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Alexander Factory, C	Alexander, N. Y	W. E. Moulton.
Beechnut Factory, B. & C	Le Roy, N. Y	J. F. Hager.
Byron Factory, B	Byron, N. Y	Horace Scarls.
The Fargo Dairy, M. S	Batavia, N. Y	Warren Fargo, 208 E. Main st.
Indian Falls Factory, B	Indian Falls, N. Y	F. E. Reynolds.
Pavilion Factory, B	Pavilion, N. Y	A. R. Bunce.

GREENE COUNTY

Halcott Center Creamery, B	Halcott Center, N. Y	Halcott Center Creamery Co., Walton.
Hensonville Cooperative Creamery, B	Hensonville, N. Y	Geo. R. Winchell.
Hunter Creamery, B	Hunter, N. Y	Max Blum, 142 Reade st., New York City.
Locust Grove Creamery, B	Oak Hill, N. Y	G. C. DeWitt.
Prattsville Dairy Co., B	Prattsville, N. Y	E. L. Moore.
S. F. S. D. Co., M. S	Ashland, N. Y	Sheffield Farms, Slawson, Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Lexington, N. Y	Sheffield Farms, Slawson, Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Prattsville, N. Y	Sheffield Farms, Slawson, Decker Co., 524 West 57th st., New York City.
Windham Elgin Creamery, B	Windham, N. Y	F. W. Braunlich.

HERKIMER COUNTY

Barto Hill, C	Little Falls, N. Y., R. F. D	Truman Belling.
Burt Grove, C	Herkimer, N. Y., R. F. D. 1	Ward Wakeman.
Bush, C	Mohawk, N. Y., R. F. D. 2	L. Springer.
Busy Corner, C	Mohawk, N. Y., R. F. D.	Chester Caguin.
Carpenter, C	Poland, N. Y., R. F. D. 1	E. W. Coon, Philadelphia, Pa.
Caswell Corners, C	Richfield Springs, N. Y	Harvey Eckler.
Cave, Samuel C	Cold Brook, N. Y., R. F. D. 1	James P. Nellis.
Cedarville Milk & Cream Co, B. & C	Cedarville, N. Y	Grant Hollenbeck & Son.
Cedarville, M. S	West Winfield, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Clover Valley, C	Little Falls, N. Y., R. F. D	C. Shant.
Cold Brook, C	Cold Brook, N. Y	F. D. Fox.
Cold Creek, C	Dolgeville, N. Y., R. F. D.	Isaac Fox.
Cold Spring Dairy Products Co., M. S	Mohawk, N. Y	L. W. Branch.
Comstalk Home Dairy, C	Salisbury, N. Y	Stephen Comstalk.
Cramers Corners Cheese Factory Association, C	Fort Plain, N. Y., R. F. D	Cramers Corners Cheese Factory Association.

HERKIMER COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Crystal Spring, B	Herkimer, N. Y	Wm. McKerron.
Cullen, C	Richfield Springs, N. Y., R. F. D. 2	C. Garline.
Deck, C	Mohawk, N. Y., R. F. D. 3	John D. Cramer.
Dicker's Dairy, C	Cold Brook, N. Y., R. F. D. 1	Mrs. C. M. Dicker.
East Winfield, M. S	West Winfield, N. Y., R. F. D	Standard Dairy Co., 611-613 East 12th st., New York City.
Eatonville, C	Little Falls, N. Y	W. J. Eaton.
Empire State Dairy, M. S	Dolgeville, N. Y	Ralph Wheeler.
Empire State Dairy Co., M. S	Little Falls, N. Y	Edward Gray.
Fairfield Centennial, C	Little Falls, N. Y	R. H. Wood.
Fairfield Dairy Association, C	Little Falls, N. Y	T. Atkins.
Fisher, F. J. C	Cold Brook, N. Y., R. F. D. 1	F. J. Fisher.
Glenside, C	Little Falls, N. Y., R. F. D. 5	George Veitch.
Gravesville, M. S	Gravesville, N. Y	J. H. Wilson, N. Y.
Henderson Association, C	Jordanville, N. Y	C. W. Crimm.
Herkimer, M. S	Herkimer, N. Y	Frank Black.
Hill Creamery, B	Little Falls, N. Y., R. D. 4	Lee Ownes.
Indian Castle, M. S	Little Falls, N. Y. R. F. D.,	H. J. Phelps.
Jacksonburg, M. S	Mohawk, N. Y., R. F. D. 3	F. D. Hinman.
Jordanville Milk and Cream Co., B. & C	Jordanville, N. Y	C. W. Crimm.
Kast Bridge, M. S	Herkimer, N. Y., R. F. D. 2	C. E. Buell.
Keller, A., C	Little Falls, N. Y	Willard Keller.
Levy Dairy Co., M. S	Middleville, N. Y	George A. Bloss.
Lints, S. P., B. & C	Frankfort, N. Y., R. F. D. 1	S. P. Lints.
Litchfield Milk Co., Inc., C	Ilion, N. Y	Bradley Fuller, Secretary, Utica N. Y.
Little Falls, C	Little Falls, N. Y	T. Atkins.
Little Falls, M. S	Little Falls, N. Y	E. Higgins.
McArthur, D., C	Grant, N. Y	D. McArthur.
McCredy Sta. No. 9, C	Mohawk, N. Y., R. F. D. 3	G. H. Van Slyke.
McKoons Crossing, M. S	Richfield Springs, N. Y.	Southwell & Barton, 359 Myrtle, ave., Brooklyn.
McVoy, R. S. C	Cold Brook, R. F. D. 1	R. S. McVoy.
Michigan Condensed Milk Co., C	Frankfort, N. Y	Worth D. Kyser (Bordens).
Michigan Condensed Milk Co., C	Newport, N. Y	Albert Borst (Bordens).
Miller & Owens, B	Herkimer, N. Y	Miller & Owens.
Millers Mills, M. S	Millers Mills, N. Y	H. F. Backus, Newark, N. J.
Mound Creek, C	Cold Brook, N. Y., R. F. D. 1	Eugene Hemstreet.
Murphy's Home Dairy, B	Salisbury, N. Y	C. H. Murphy.
Newport Cooperative Dairy Co., M. S	Newport, N. Y	G. W. Bishop.
Newport Hill, B. & C	Newport, N. Y., R. F. D.	Jas. P. Brown & Son, Utica, N. Y.
Newville, C	Little Falls, N. Y	Jacob Zoller Co.
North Litchfield, C	Clayville, N. Y., R. F. D.	J. D. Young, Cassville.

HERKIMER COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
North Norway, C	**Gray, N. Y**	**Sylvester Stanley.**
North Winfield, C	**West Winfield, N. Y., R. F. D**	**J. D. Young, Cassville.**
Old Fairfield, C	**Fairfield, N. Y**	**C. W. Rice.**
Old Manheim, C	**Little Falls, N. Y., R. F. D**	**Joseph Rice.**
Old Salisbury, C	**Little Falls, N. Y**	**E. J. Burrell.**
Platform, C	**Middleville, N. Y**	**A. Harter & C. W. Willard.**
Poland, M. S	**Poland, N. Y**	**J. E. Rosasco.**
Ransom, C. W., C,	**Little Falls, N. Y., R. F. F. D., 2**	**C. W. Ransom.**
Rising Star, C	**Mohwak, N. Y., R. F. D. 2**	**N. H. Conrad.**
Rockdale Co., M. S	**West Winfield.**	**J. H. Curtis.**
Ruby, C	**Middleville, N. Y**	**J. R. Peters.**
Schuyler Centennial, C	**Frankfort, N. Y., R. F. D. 1**	**Elmer Farrington.**
Schuyler Junction, M. S	**Frankfort, N. Y**	**James S. Lewis.**
Shady Brook, C	**Deerfield, N. Y**	**J. Reagan.**
Shady Brook, C	**Newport, N. Y., R. F. D.**	**John R. Rojan.**
Shells Bush, C	**Herkimer, N. Y., R. F. D.**	**Samuel Gordon.**
Slate Ridge, C	**Little Falls, N. Y**	**R. D. Cooper.**
Smalls Bush, C	**Herkimer, N. Y., R. F. D. 1**	**Earl Ward.**
Snyder Bros. Home Dairy, C	**Cold Brook, N. Y., R. F. D. 1**	**G. & F. Snyder.**
Snyder, John, Home Dairy, C	**Cold Brook, N. Y., R. F. D. 1**	**Fred Snyder.**
South Columbia, M. S	**Richfield Springs, N. Y**	**H. F. Backus, Newark, N. J.**
Starkville Skimming Station, C	**Fort Plain, N. Y., R. F. D.**	**Chas. N. Smith.**
Sunny Hill, B	**Little Falls, N. Y**	**J. D. Frederiksen.**
Ubler, C	**Frankfort, N. Y., R. F. D. 1**	**W. J. Ubler.**
Van Hornesville, C	**Van Hornesville, N. Y**	**B. Whipple, Utica, N. Y.**
West Winfield, M. S	**West Winfield**	**Eugene Case (Borden's).**

JEFFERSON COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Adams Center Milk Station, M. S., C. & Cream	**Adams Center, N. Y**	**Libby, McNeil & Libby, Chicago, Ill.**
Antwerp Factory, B. & C	**Antwerp, N. Y**	**F. X. Baumert & Co.**
Atwood, C	**Watertown, N. Y**	**Jacob Vogt.**
Arnstein, H , M. S	**Philadelphia, N. Y**	**H. Arnstein, E. L. Steunhauser, Manager.**
Bacon McNeil, C	**Theresa, N. Y**	**Jos. Vock & Son.**
Balts, C	**Lafargeville, N. Y**	**Henry Leonhardt, Alexandria Bay, N. Y.**
Bayview, C	**Dexter, N. Y**	**Fred. Londsdale.**
Beckelhaupt Comb. No. 2, C	**Redwood, N. Y**	**A. Beckelhaupt, Redwood, N. Y.**
Beckelhaupt Comb. No. 3, C	**Lafargeville, N. Y**	**A. Beckelhaupt, Redwood, N. Y.**
Beckelhaupt Comb. No. 5, C	**Theresa, N. Y**	**A. Beckelhaupt, Redwood, N. Y.**
Beckelhaupt Comb. No. 7, C	**Theresa, N. Y**	**A. Beckelhaupt, Redwood, N. Y.**
Beckelhaupt Comb. No. 8, C	**Redwood, N. Y**	**A. Beckelhaupt, Redwood, N. Y.**
Beckelhaupt Comb. No. 9, C	**Redwood, N. Y., R. F. D.**	**A. Beckelhaupt, Redwood, N. Y.**
Beckelhaupt Comb. No. 10, C	**Theresa, N. Y., R. F. D.**	**A Beckelhaupt, Redwood, N. Y.**

JEFFERSON COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Beckelhaupt Comb. No. 12, C	Redwood, N. Y., R. F. D	A. Beckelhaupt, Redwood, N. Y.
Beckelhaupt Comb. No. 13, C	Clayton, N. Y., R. F. D	A. Beckelhaupt, Redwood, N. Y.
Beckelhaupt Comb. No. 15, C	Lafargeville, R. F. D	A. Beckelhaupt, Redwood, N. Y.
Beckelhaupt Comb. No. 16, C	Lafargeville, N. Y., R. F. D	A. Beckelhaupt, Redwood, N. Y.
Beckelhaupt Comb. No. 17, C	Orleans Corners, N. Y., R. F. D	A. Beckelhaupt, Redwood, N. Y.
Beckelhaupt Comb. No. 19, C	Lyme, R. F. D	A. Beckelhaupt, Redwood, N. Y.
Beckwith Creamery, B. & M	Fine View, N. Y	W. G. Beckwith.
Belleville, B. & C	Belleville, N. Y	W. H. Green, Adams, N. Y., R. F. D. 3.
Black River, C. & M	Black River, N. Y	Frank F. Hatch, 105 West 46th st., New York City.
Brookside Cheese Factory, C	Rodman, N. Y	Gomer Davis,
Buckminster, C	Watertown, N. Y	Jacob Vogt.
Bullard, H. A., (Drill Well), C	Sterlingville, N. Y., R. F. D	H. A. Bullard.
Cape Vincent Creamery, B	Cape Vincent, N. Y	W. F. Drennen & Co.
Carthage, M. S	Carthage, N. Y	Henry Anstein, 101 West 140th st., New York City.
Cascade, B. & C	Watertown, N. Y., R. F. D. 2	Vernon H. Peck.
Champion Village, B. & C	Carthage, N. Y	W. H. Loomis.
Chapel Corners, C	Theresa, N. Y., R. F. D	Chris Dugan.
Chaumont, C	Chaumont, N. Y	J. J. Dillenbeck.
Clayton Milk Station, C. & M	Clayton, N. Y	Ullman & Hauk, 513 West 131st st., New York City.
Cold Brook, C	Lafargeville, N. Y., R. F. D	Frank Dollinger.
Cold Spring, B. & C	Redwood, N. Y	Emmet Moore.
Columbian, C	Fine View, N. Y	W. G. Beckwith.
Crescent, C	Philadelphia, N. Y	F. X. Baumert, Antwerp, N. Y.
Dexter Dairy Co., C	Dexter, N. Y	A. A. Phelps.
Diamond, C	Mannsville, N. Y	J. J. Laufear.
Dickson, C	Antwerp, N. Y	F. X. Baumert & Co.
Douglas, C	Theresa, N. Y	Arthur Stewart.
Eames, C	Watertown, N. Y	H. C. Eames, 321 Winslow st.
East Antwerp, C	Antwerp, N. Y	Elmer Swem.
East Rodman, C	East Rodman, N. Y	Fred. P. Dunnaway, Watertown, N. Y.
Eureka, B. & C	Watertown, R. F. D. 5	S. A. Hall.
Evans Mills, C	Evans Mills, N. Y	F. X. Baumert & Co., Antwerp, N. Y.
Excelsior, C	Limerick, N. Y., R. F. D. 2.	John Dietrich.
Fairview, M. S	Pamelia, N. Y	R. P. Grant, Clayton, N. Y.
Farmers', B. & C	Clayton, N. Y	R. P. Grant.
Flat Rock, C	Plessis, N. Y	Clark Walts.
Fox Creek, C	Cape Vincent, N. Y	B. W. Hentze, 3-Mile Bay, N. Y.
Fults, C	Watertown, N. Y	Jacob Vogt.
Galloway Street, C	Philadelphia, N. Y	Frank Hoover & Son, Sterlingville, N. Y.
Gates, C	Watertown, N. Y	Jacob Vogt.
Gilt Edge Creamery (Taylor Factory), B. & C	Mannsville, N. Y	W. J. Grant.
Gould, C	Evans Mills, N. Y	S. N. Gould.

JEFFERSON COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Great Bend, M. S	Great Bend, N. Y	Lambert Dairy Co., 615 West 129th st, New York City.
Grenadier Island, C	Cape Vincent, N. Y	John D. Fitzgerald.
Grindstone, C	Clayton, N. Y	R. P. Grant.
Haas, John, C	Watertown, N. Y	John Vogt.
Hadsall & Orvis, C	Felts Mills, N. Y	Geo. O. Orvis, Black River, N. Y.
Haller, Conrad, C	Lafargeville, N. Y	Conrad Haller.
Halls Corners, C	Antwerp, N. Y	F. X. Baumert & Co.
Hartman Factory, John, C	Alexandria Bay, N. Y	John Hartman.
Henderson, B. & C.,	Henderson, N. Y	Henry Bonnett, Secy, Adams, R. F. D. 3.
Hillside Factory, B. & C	Philadelphia, N. Y	F. X. Baumert & Co., Antwerp, N. Y.
Hill Spring Cheese Factory, B. & C.	Omar, N. Y	O. M. Snow, Secretary.
Holmes, C	Theresa, N. Y	Jos. Vock & Son.
Hoover & Son, Frank, C	Sterlingville, N. Y	Frank Hoover.
Howland, C	Theresa, N. Y	Jos. Vock & Son.
Hyde Creek	Orleans Four Corners, N. Y	F. W. Shimel, Secretary.
Indian River, C	Carthage, N. Y., R. F. D.	F. X. Baumert & Co., Antwerp, N. Y.
Jefferson Valley, C	Theresa, N. Y	Isaac Shell.
Keens, M. S	Hailsboro, N. Y	Borden's Condensed Milk Co., H. M. Lasher, Mgr.
Kelsey Bridge, C	Theresa, N. Y., R. F. D.	Jos. Vock & Son.
Lafargeville, M. S	Lafargeville, N. Y	L. Dietrich.
Lake View, C	Evans Mills, N. Y	Jos. Vock & Son, Theresa, N. Y.
Leonhardt, C	Alexandria Bay, N. Y	Henry Leonhardt, Redwood, N. Y.
Lime Road, C	Clayton, N. Y	R. P. Grant.
Lorraine Milk Co., B. & C	Lorraine, N. Y	O. W. Tucker.
Mannsville Cheese Factory, C	Mannsville, N. Y	Jefferson County Creamery Co.
Mannsville Milk Station, M. S	Mannsville, N. Y	J. H. Mullar, 130 West 61st st., New York City.
Maple Grove, B. & C	Mannsville, N. Y	E. J. Rudd.
Mather Bros., B. & C	Adams, R. F. D. 3	A. A. Scott, Adams, N. Y.
Mellins Bay, C	Cape Vincent, N. Y	Ray Dodge, Secretary.
New Connecticut, C	Theresa, N. Y	Joseph Vock & Son.
New Model, Dairy Product Co., B. & C	Henderson, N. Y	T. J. Lyng Bros.
North Rodman, C	Adams Center, N. Y	W. E. Sill & J. R. Dillon.
Ontario Factory, B. & C	Sacket Harbor, N. Y	A. A. Phelps, Dexter, N. Y.
Orleans Valley, C	Orleans Four Corners, N. Y	Ullman & Hauk, New York City.
Orleans Center, C	Lafargeville, N. Y	James Haggart.
Orleans Corners, M. S	Orleans Corners, N. Y	Ullman & Hauk, New York City.
Pamelia Center, C	Watertown, N. Y., R. F. D. 4	F. X. Baumert Co., Antwerp, N. Y.
Patrons, C	Brownsville, N. Y	Walter E. Walker.
Perry, C	Limerick, N. Y	L. S. Perry.
Philadelphia Cheese Factory, C. & M.	Philadelphia, N. Y	Wm. Flath.

JEFFERSON COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Philadelphia, M. S.	Philadelphia, N. Y.	Henry Arnstein, 101 West 140th st., New York City.
Pierrepont Manor, M. S.	Pierrepont Manor, N. Y.	Wm. Slothman, 23 Margin st., New York City.
Pillar Point Central, B. & C.	Dexter, N. Y.	C. C. Mearns.
Pillar Point Union, C.	Limerick, N. Y., R. F. D. 1	W. H. B. Smith.
Pleasant Valley, C.	Cape Vincent, N. Y.	George Laird, Secretary, Rosiere, N. Y.
Point Peninsular Creamery, C.	Point Peninsular, N. Y.	Failing Brothers.
Pool, C.	Theresa, N. Y.	Jos. Vock & Son.
Redwood Station, M. S.	Redwood, N. Y.	B. H. Marks, New York City.
Reynolds, C.	Watertown, N. Y.	John Vogt.
Rices Milk Station, M. S.	Rices, N. Y.	Tuting & Heimes, 693 Washington st., New York City.
River, C.	Theresa, N. Y.	Jos. Vock & Son.
Riverside, B. & C.	Ox Bow, N. Y.	Dixon & Gleason.
Rock Brook, B. & C.	Evans Mills, N. Y.	E. J. Biche.
Rocky Ledge, C.	Evans Mills, N. Y.	F. X. Baumert Co., Antwerp, N. Y.
Rodman Village Factory, B. & C.	Rodman, N. Y.	Davis & Casler.
Rosemary Creamery, B.	Smithville, N. Y.	Rosemary Creamery Co., Adams N. Y.
Rosemary Creamery Co., C.	Adams, N. Y.	Rosemary Creamery Co., Adams, N. Y.
Rosiere, B. & M.	Rosiere, N. Y.	M. G. Gosier, Secretary.
Sandy Creek, C.	Rodman, N. Y.	O. N. Heath.
Scoville, C.	Watertown, N. Y.	Jacob Vogt.
Shurtleff Station, M. S.	Philadelphia, N. Y.	Model Dairy Co., 246 Eighth ave., New York City.
Silver Creek, C.	Rodman, N. Y., R. F. D.	Jacob Davis.
Smith Dairy Co., B. & C.	Adams, N. Y.	G. S. Robbins.
South Brook, C.	Cape Vincent, N. Y.	P. S. Judd.
South Champion Factory, B. & C.	Copenhagen, R. F. D. 3	Robert Cramer.
Sprague & Piper, C.	Theresa, N. Y.	Jos. Vock & Son.
Spring Cheese Factory, C.	Philadelphia, N. Y.	W. O. Markwich.
Springer, C.	Redwood, N. Y.	Hiram Hafford.
Star Brook, C.	Barnes Corners, N. Y.	M. L. Thompson, Croghan, N. Y.
Sterlingville, C. & M.	Sterlingville, N. Y.	H. Arnstein, 101 West 140th st., New York City.
Stewart, C.	Evans Mills, N. Y.	F. X. Baumert & Co., Antwerp, N. Y.
Still, C.	Theresa, N. Y.	Jos. Vock & Son.
Stone Mills Union, C.	Lafargeville, N. Y., R. F. D.	Zenas Dean.
Sunny Side, C.	Evans Mills, N. Y.	S. A. & A. E. Helmer.
Taylorville, B. & C.	Copenhagen, N. Y., R. F. D. 3	D. A. Goodrich.
Theresa Milk Station, M. S.	Theresa, N. Y.	Central Dairy Co., 326 East 103d st., New York City, N. Y.
1000 Island Cheese Factory, C.	Clayton, N. Y.	R. P. Grant.
Thousand Island Creamery, B. & C	Alexandria Bay, N. Y.	Burton S. Tracy.
Three Mile Bay, C.	Three Mile Bay, N. Y.	J. Wells Taft, Manager.
Trout, C.	Evans Mills, N. Y.	F. X. Baumert & Co., Antwerp, N. Y.

JEFFERSON COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Trout Brook, C	Carthage, N. Y., R. F. D.	F. X. Baumert & Co., Antwerp, N. Y.
Vogt, C	Watertown, N. Y	Jacob Vogt.
Walters, C	Watertown, N. Y	Jacob Vogt.
Warren Settlement, C	Rosiere, N. Y	Geo. H. Gomeiri.
Watertown Valley, B. & C	Burns Mills, N. Y	L. Polley.
West Carthage, C	Carthage, N. Y	Charles E. Besah.
Wheeler, C	Theresa, N. Y	Jos. Vock & Son.
William No. 2, C	Watertown, N. Y., R. F. D. 2	M. A. Stacher.
Wilna Central Factory, C	Carthage, N. Y	Jas. Pierce.
Wilna Farms Co., B. & C	Carthage, N. Y	A. B. Vickler, Manager.
Wilson Bay, C	Cape Vincent, N. Y., R. F. D	F. H. Moore, Secretary.
Wind Mill, C	Watertown, R. F. D	G. B. McMullin.
Woolworth Cheese Factory, C	Carthage, N. Y	Mrs. S. A. Woolworth.
Worth Butter, Cheese & Cream Co., B. & C	Worthville, N. Y	C. D. Hitchcock.
Worth Center Cheese Factory, C	Adams, N. Y., R. F. D. 1	J. M. O'Connor.
Yost, B. & C	Antwerp, N. Y	Dixon & Gleason.

KINGS COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Alexander Campbell, M. S	Brooklyn, N. Y	Alexander Campbell Milk Co., 802 Fulton st.

LEWIS COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Alger Factory, B	Martinsburg, N. Y	G. W. Alger.
Ankin, C	Constableville, N. Y	Edward O. Ankin.
Arctic Union, B. & C	Croghan, N. Y	George Bush.
Barnes' Corners, B. & C	Barnes' Corners, N. Y	Loren D. Fox.
Beach Hill, C	Croghan, N. Y	Henry Mers.
Beaver Falls, M. S	Beaver Falls, N. Y	Alex. Campbell Milk Co., 802 Fulton st., Brooklyn, N. Y.
Black River Valley Cream & Milk Co., M. S	Lyons Falls, N. Y., R. F. D. 1	John Lemkau, 678 East 113th st., New York City.
Boston Brand, B. & C	Lowville, N. Y	H. O. Davis.
Burns Factory, F. M., B. & C	Copenhagen, N. Y., R. F. D. 2	John May.
Castorland, M. & C	Castorland, N. Y	Central Dairy Co., 326 East 103d st., New York City.
Cedar Spring, C	Glenfield, N. Y	M. J. Fries.
Cloverdale Cheese Factory, B. & C.	Constableville, R. F. D. 1.	Fred Krambuhl.
Confiers Corners, C	West Leyden, N. Y	Philip Scheidleman, 192 Varick st., Utica, N. Y.
Copenhagen Condensary, Cond. M. & C	Copenhagen, N. Y	Brown & Bailey Co., 90 Third ave., Brooklyn, N. Y.
Crown Brand M. Co., B. & C	Denmark, N. Y	J. T. Martin, Secretary.
Crystal Brook, C	Boyd, N. Y	Dan Ryan, Copenhagen, N. Y.
Dairy Hill Cheese Factory, B. & C.	Constableville, N. Y	Edward Miller.
Deer River, M. S	Deer River, N. Y	H. M. Schwarz, New York City.

LEWIS COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Denly Station, M. & C.	Leyden Station, N. Y.	Henry Anster, 101 West 140th st., New York City.
Dobson Cheese Factory, C.	Harrisville, N. Y.	W. A. Wear.
Domser, C.	Boonville, N. Y.	Philip Domser.
Eagle, B. & C.	Lowville, N. Y., R. F. D. 4	Glenn Bellenger.
East Martinsburg Milk Station, M. S.	East Martinsburg, N. Y.	McDermott Dairy Co., 127 West 42d st., New York City.
Erie, C.	Harrisville, N. Y.	H. W. Stevens.
Excelsior Factory, C.	Copenhagen, N. Y.	Thomas Murphy.
Fall Brook or Pinney Settlement, C.	Port Leyden, N. Y.	Wm. F. Karlen, Boonville, N. Y.
Farmers' Choice, C.	New Bremen, N. Y.	Wm. S. Benton.
Fish Creek, C.	Lyons Falls, N. Y.	J. D. Karlen, Boonville, N. Y.
Forest Hill, B. & C.	Constableville, N. Y.	Jas. E. Allen.
Forks, No. 2, B. & C.	Copenhagen, N. Y., R. F. D. 2	Chas. Hubbard.
Forks, B. & C.	Copenhagen, N. Y.	W. E. Brainard.
Glenfield Milk Station, M. S.	Glenfield, N. Y.	McDermott Dairy Co., 127 West 42d st., New York City.
Gomer Hill, C.	Turin, N. Y.	Jacob Disch.
Grand Central, B. & C.	Lowville, N. Y., R. F. D. 4	R. C. Merkley.
Grieg, C.	Lyons Falls, N. Y., R. F. D.	Wm. F. Karlen, Boonville, N. Y.
High Market, C.	Constableville, N. Y.	A. G. Blum.
Houseville, B. & C.	Glenfield, N. Y.	Hargraves & Rees, Lowville, N. Y.
Imperial, B. & C.	Carthage, N. Y.	George H. Vorce.
Jerden Falls, C.	Croghan, N. Y.	Cris Yonsey.
Karsmayer Creamery, C.	Boonville, N. Y.	A. G. Blum.
Kirchnerville, C.	Croghan, N. Y.	P. J. Ulrich.
Lake, C.	Harrisville, N. Y.	E. P. Lake.
Legal Tender, B. & C.	Constableville, N. Y.	John O'Shea.
Lindsay, C.	Florence, N. Y., R. F. D.	Frank Brayton.
Lowville Milk Station, M. S.	Lowville, N. Y.	McDermott Dairy Co., 127 West 42d st., New York City, N. Y.
Lowville Milk & Cream Co., M. S.	Lowville, N. Y.	John D. Moore, Secretary.
Lyons Falls, M. S.	Lyons Falls, N. Y.	Henry Anster, 101 West 140th st., New York City.
McGrath Factory, B. & C.	West Martinsburg, N. Y.	J. A. McGrath.
Maple Ridge, B. & C.	Martinsburg, N. Y.	L. J. Benton, Secretary.
Mayflower, C.	Harrisville, N. Y.	G. M. Monier.
Meadow Brook, B. & C.	Boonville, N. Y.	Uriah Fitch.
Middlebranch, C.	Harrisville, N. Y.	Chas. Mayhew.
Miller Cheese Factory, B. & C.	Constableville, N. Y.	Hilton E. Mills.
Mohawk Hill, B. & C.	Constableville, N. Y., R. F. D. 2	J. F. Bower.
Mores Creek, C.	West Leyden, N. Y.	David Karlen, Rome, N. Y.
Mountain Spring, C.	Castorland, R. F. D. 2	John Yancey.
Mud Lake, C.	West Leyden, N. Y.	Henry Sheff.
Murmer Creek, C.	Kirchnerville, N. Y.	A. N. Renaux.
Natural Bridge, M. S.	Natural Bridge, N. Y.	Standard Dairy Co., 511, 512 East 12th st., New York City.
New Boston, B. & C.	Copenhagen, N. Y.	E. J. Schramp.

LEWIS COUNTY — (*Continued*)

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
New Bremen Milk Station, M. S.	New Bremen, N. Y.	Alex. Campbell Milk Co., 802 Fulton st., Brooklyn, N. Y.
New Columbia Factory, B. & C.	Copenhagen, N. Y., R. F. D. 1	George N. Vary.
New Model, C.	Copenhagen, N. Y., R. F. D. 1	H. E. Kelsey.
Osceola, C.	Osceola, N. Y.	John Fox.
Pinckney Corners, B. & C.	Copenhagen, N. Y., R. F. D. 2, Box 6	H. D. Whiting.
Pine View Milk & Cream Co., C.	Glenfield, N. Y.	Burt Waldron.
Pleasant View, B. & C.	Castorland, N. Y.	Peter Bachman.
Plumer, C.	Constableville, N. Y.	G. H. Plumer.
Prussian Settlement, C.	West Leyden, N. Y.	John W. Beha.
Rector, B. & C.	Rector, N. Y.	Wm. Hoffman.
Regets, C.	Constableville, N. Y.	J. F. Bower.
Rock Spring, C.	West Leyden, N. Y.	Byron W. Trainor.
Roser, C.	Ava, N. Y.	David Karlen, Rome, N. Y.
Searl, M. E., B. & C.	Lowville, N. Y.	M. E. Searl.
Silver Spring Dairy Co., C.	Copenhagen, N. Y., R. F. D. 1	E. Ingram.
Sims Bros., C.	West Leyden, N. Y.	Joseph Sims.
South Harrisburg, B. & C.	Copenhagen, N. Y., R. F. D. 1	E. C. Lennox.
Star Brook, C.	Barnes' Corners, N. Y.	M. S. Thomson, Croghan, N. Y.
Sterling, C.	Natural Bridge, N. Y.	A. E. Ponto.
Sulphur Spring, B. & C.	Lowville, N. Y.	Charles Henry.
Swiss Creek, B. & C.	Castorland, N. Y.	Peter Bachman.
Talcottville Cheese, Butter, Milk & Cream Co.	Talcottville, N. Y.	W. S. Merriam, Talcottville, N. Y.
Thayer Hill, C.	Boonville, N. Y.	Wm. F. Karlen.
Turin Milk & Cream Co., B. & C.	Turin, N. Y.	Clark M. Barnes.
Union Dairy Factory, C.	Turin, N. Y.	Arthur Swackhamer.
Union of Pinckney, B. & C.	Copenhagen, N. Y., R. F. D. 3	Henry Baker.
Valley Dale, C.	Harrisburg, N. Y.	Fred M. Burns, Copenhagen, R. F. D. 1.
Valley Spring, B. & C.	Martinsburg, N. Y.	Fred H. Loucks.
Weiler Corners, C.	Boonville, N. Y.	David Miller.
Welsh Hill Factory, C.	Turin, N. Y.	E. H. Evans.
West Harrisburg, B. & C.	Copenhagen, N. Y.	Earl I. Wheeler.
West Leyden, C.	West Leyden, N. Y.	Albert F. Miller.
West Martinsburg Milk & Cheese Co., C.	West Martinsburg, N. Y.	E. B. Curtis, Secretary, Lowville N. Y.
Willow Grove Milk & Cheese Co., B. & C.	Lowville, R. F. D. 2	Wm. T. Finn.
Willow Spring, C.	Castorland, N. Y.	E. E. Widmeyer.

LIVINGSTON COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Ashantee Factory, B.	Avon, N. Y.	Herbert Wadsworth.
Byresville Factory, C.	Dansville, N. Y.	Elmer Blank.
East Koy Factory, C.	Portageville, N. Y.	Fillmore Belfast Dairy Products Co., Fillmore, N. Y.

LIVINGSTON COUNTY—*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Genesee Valley Factory, M. S.	Lakeville, N. Y.	G. A. Cogswell, 73 Exchange st., Rochester, N. Y.
Hunt Factory, C	Hunt, N. Y.	Fillmore Belfast Dairy Products Co., Fillmore, N. Y.
Keshequa Factory, C	Datton, N. Y.	Mrs. Sarah Wheeler.
Orchard Farm Factory, B	Mount Morris, N. Y.	W. A. Miller.
Ridge Factory, C	Mount Morris, N. Y.	Bert R. Mann.
Rosses Factory, C	Nunda, N. Y.	Mrs. Sarah Wheeler.
Scottsburg Factory, B	Scottsburg, N. Y.	G. E. Meyer.
Tuscarora Factory, C	Tuscarora, N. Y.	John E. Creveling.
West Villa Factory, C	Dansville, N. Y.	N. Sanford.

MADISON COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Balina, M. S	Webster Station, N. Y.	Ullmann Hank Dairy Co., 513 West 31st st., New York City. N. Y.
Beaver Creek Factory, C	Waterville, N. Y.	Beaver Creek Cheese Co., Waterville, N. Y.
Bingley, M. S	Casenovia, N. Y.	Edelstein Dairy Co., 48 Seigel st., Brooklyn, N. Y.
Blakeslee Creamery, M. S	Perryville, N. Y.	J. Cohen, 16 Moore st., Brooklyn,
Blanding Factory, C	Brookfield, N. Y.	Excelsior Dairy Co.
Bouckville, M. S	Bouckville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Earlville, M. S	Earlville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Siloam, M. S	Siloam, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Solsville, M. S	Solsville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Wampsville, M. S	Wampsville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
West Edmeston, M. S	Brookfield, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Bridgeport Factory, C	Bridgeport, N. Y.	Bridgeport Milk Association, Inc., Kirkville, N. Y.
Brookfield Factory, C	Brookfield, N. Y.	C. O. York.
Brooklyn, M. S	Casenovia, N. Y.	Flanagan & North.
Canastota, M. S	Canastota, N. Y.	Sam Levy Dairy Co., 320 Avenue A, New York City.
Cazenovia, M. S	Casenovia, N. Y.	E. G. Haviland, 367 Seventh ave., Brooklyn, N. Y.
Canastota Factory, B	Canastota, N. Y.	Foland & Latan.
Chittenango, M. S	Chittenango Station, N. Y.	Levy Dairy Co., 320–322 Avenue A, New York City.
Clockville, M. S	Canastota, N. Y., R. F. D. 6	Levy Dairy Co., 320–322 Avenue A, New York City.

MADISON COUNTY —*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Cold Springs Factory, C	Brookfield, N. Y	Simeon Brown, South Hamilton, N. Y.
Crystal Springs, M. S	Canastota, N. Y	I. Cohen, 16 Moore st., Brooklyn, N. Y.
De Ruyter, M. S	De Ruyter, N. Y	E. G. Haviland, 367 Seventh ave., Brooklyn, N. Y.
Eaton, M. S	Eaton, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Erieville, M. S	Erieville, N. Y	D. P. Maynard.
Georgetown, M. S	Georgetown Station, N. Y.	Central Dairy Co., 326 East 103d st., New York City.
Georgetown Village, M. S	Georgetown, N. Y	E. Fred Sanders.
Hamilton, M. S	Hamilton, N. Y	Herman Stuhring, 694 Ninth ave., New York City.
Hermitage Farm, M. S	Canastota, N. Y	I. F. Chapman & Son.
Hubbardsville, M. S	Hubbardsville, N. Y	Empire State Dairy Co., 502 Broadway, Brooklyn, N. Y.
Kenwood, M. S	Kenwood, N. Y	Wm. Jordan, Union Hill, N. J.
Lakeport, M. S	Chittenango Station, N. Y.	Standard Dairy Co., 611-613 East 12th st., New York City.
Lakewood Factory, C	Chittenango Station, N. Y.	L. W. Taylor.
Lenox Furnace, M. S	Wampsville, N. Y	National Dairy Co., 358 Cortlandt st., Brooklyn, N. Y.
Leonardsville, M. S	Leonardsville, N. Y	Phenix Cheese Co., South-Edmeston, N. Y.
Lebanon Central, M. S	Lebanon, N. Y	Central Dairy Co., 326 East 103d st., New York City.
Lebanon Farmers', M. S	Lebanon, N. Y	L. Edelstein, 48 Seigel st., Brooklyn, N. Y.
Lloyds, M. S	Oneida, N. Y	Lloyd Creamery Co., Oneida, N. Y.
Middle States, M. S	Canastota, N. Y	Middle States Creamery Co., 294 Powers st., Brooklyn, N. Y.
Munnsville, M. S	Munnsville, N. Y	John Muller, 130 West 61st st., New York City.
Morrisville, R. R., M. S	Morrisville, N. Y	Leroy Dairy Co., 320 Avenue A, New York City.
Morrisville Farmers, M. S	Morrisville Station, N. Y.	Leroy Dairy Co., 320 Avenue A, New York City.
Nelson Factory, C	Nelson, N. Y	Samuel Fieldman, 618 East 9th st., New York City.
New Woodstock, M. S	New Woodstock, N. Y	R. F. Stevens Co., 90 Third ave., Brooklyn, N. Y.
North Brookfield, M. S	North Brookfield, N. Y	High Ground Dairy Co., 451 Madison st., Brooklyn, N. Y.
Paramount Factory, C	Erieville, N. Y., R. D. 1	Paramount Cheese Co.
Poolville, M. S	Poolville, N. Y	Levy Dairy Co., 320 Avenue A, New York City.
Pratts, M. S	Pratts Hollow, N. Y	E. Gardner & John Dosher, Centerville Station and 343 West 38th st., New York City.
Randallsville, M. S	Randallsville, N. Y	Fred Wolpmann, 586 Hudson Bldg., North Hoboken, N. J.

MADISON COUNTY —*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
River Forks, M. S.	**Unadilla Forks, N. Y.**	**Phenix Cheese Co., South Edmeston, N. Y.**
Sheds, M. S.	**Sheds, N. Y.**	**Levy Dairy Co., 320 Avenue A, New York City.**
Shefford Factory, C.	**Chittenango, N. Y.**	**Kingan Provision Co., Syracuse, N. Y.**
Siloam Factory, C.	**Wampsville, N. Y.**	**Middle States Creamery Co., 204 Powers st., Brooklyn, N. Y.**
South Bay Milk Station, M. S.	**Canastota, N. Y.**	**Levy Dairy Co., 320 Avenue A, New York City.**
Sullivan, M. S	**East Boston, N. Y.**	**Standard Dairy Co., 611, 613 East 12th st., New York City.**
Talley Factory, C.	**Brookfield, N. Y.**	**Robert F. Hart, Norwich, N. Y.**
Valley Mills, M. S.	**Valley Mills, N. Y.**	**J. H. Muller, 130 West 61st st., New York City.**
Wampsville, M. S.	**Wampsville, N. Y.**	**Chris Oher, 360 Oakland st., Brooklyn, N. Y.**

MONROE COUNTY

Big Elm Dairy Co., M. S.	Rochester, N. Y.	A. E. Wood, 476 Exchange st.
Brighton Place Dairy Co., Cry.	Rochester, N. Y.	P. J. Cogswell, 1757 East ave.

MONTGOMERY COUNTY

Ames Factory, C.	**Ames, N. Y.**	**John L. Yeardon.**
Ashland, M. S.	**Ashland, N. Y.**	**David Watts, Fort Plain, N. Y.**
Borden's, M. S.	**Fort Plain, N. Y.**	**Borden's Condensed Milk Co., 108 Hudson st., New York City.**
Brown & Bailey, Cond.	**Canajoharie, N. Y.**	**John & B. Gundem.**
Brown & Bailey, Cond.	**Ames, N. Y.**	**John & B. Gundem.**
Brown & Bailey, Cond.	**Buel Station, N. Y.**	**John & B. Gundem.**
Cayadritta Factory, C.	**Fonda, N. Y.**	**Eli Smith.**
Charleston Factory, C.	**Glen, N. Y.**	**H. K. Ingersoll.**
Clover Leaf, M. S.	**Amsterdam, N. Y.**	**Clover Leaf Milk Co., Amsterdam, N. Y.**
Clover Leaf, M. S.	**Tribes Hill, N. Y.**	**Clover Leaf Milk Co., Amsterdam, N. Y.**
Dairy Kitchen, M. S.	**Fort Plain, N. Y.**	**Charles N. Smith.**
Flatt Creek Creamery, B.	**Sprakers, N. Y., R. F. D.**	**William Burns.**
Fort Hunter, M. S.	**Fort Hunter, N. Y.**	**J. E. Rossasco, 13 Morton st.**
Fort Plain Creamery, M. S.	**Fort Plain, N. Y.**	**David Watts.**
Hallsville, M. S.	**Hallsville, N. Y.**	**David Watts, Fort Plain, N. Y.**
Fultonville, Cond.	**Fultonville, N. Y.**	**Orange County Milk Association, 138 West 31st st., New York City.**
Glen Creamery, B. & C.	**Glen, N. Y.**	**H. D. Shelp.**
Getman Factory, C.	**Fort Plain, N. Y.**	**Casper Getman.**
Hassville Factory, C.	**Fort Plain, N. Y.**	**Mrs. H. M. Eldridge.**
Interstate, M. S.	**St. Johnsville, N. Y.**	**Interstate Milk & Cream Co., 325 East 111th st., New York City.**
Lykers Corners Factory, C.	**Sprakers, N. Y.**	**John V. Lyker.**
Levy Dairy, M. S.	**Sprakers, N. Y.**	**John Miller.**
Maple Grove Factory, C.	**Glen, N. Y.**	**F. H. Pruyn.**

MONTGOMERY COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Marshville Factory, C.	Canajoharie, N. Y., R. F. D. 2	Geo. Koucher.
Michaelsen's Creamery, M. S.	Canajoharie, N. Y.	John Jung.
Mohawk Factory, C.	Fonda, N. Y.	Daniel Doxtater, Palantine Bridge.
Mohawk Condensed Milk Co., Cond.	St. Johnsville, N. Y.	Frank Gebbie.
Nadler Creamery, M. S.	Amsterdam, N. Y.	Nadler Bros.
Nellis Factory, C.	Fort Plain, N. Y.	Raymond Nellis.
Palatine Union Factory, C.	Palatine Bridge, N. Y., R. F. D. 1	P. G. Yost.
Randall Factory, C.	Randall, N. Y.	Central Dairy Co., 326 East 103rd st., New York City.
Root Factory, C.	Sprakers, N. Y., R. F. D. 1	Earl Dievendorf.
Rex, M. S.	Rex, N. Y.	David Watt, Fort Plain, N. Y.
Salt Springville, M. S.	Salt Springville, N. Y.	David Watt, Fort Plain, N. Y.
Sprout Brook, M. S.	Sprout Brook, N. Y.	David Watt, Fort Plain, N. Y.
Stone Arabia, Sk. Station	Fort Plain, N. Y.	Charles N. Smith.
Valley Factory, C.	Salt Springville, N. Y.	Geo. Rogers.
Zoller Factory, C.	Little Falls, N. Y.	Jacob Zoller Co.,

ONEIDA COUNTY

Adams Factory, C.	Ava, N. Y.	Oliver Ernest, Ava.
Agan & Moore, M. S.	Rome, N. Y.	Agan & Moore, 404 Court st.
Alder Creek Milk Station, M. S.	Boonville, N. Y., R. F. D. 3	Alfred Rogers.
Ankin Bros., C.	Lee Center, N. Y.	Ankin Bros.
Ankins, Hawkins Corners, C.	Rome, N. Y.	Chas. D. Ankin.
Annsville, No. 24, C.	Taberg, N. Y.	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Augusta Dairy Association, B. & C.	Augusta, N. Y.	M. R. Pursell.
Ava Corners, C.	Ava, N. Y.	David Karlen, Boonville, N. Y.
Baker, C.	Remsen, N. Y., R. F. D.	John Baker.
Bartlett, C.	Bartlett, N. Y.	Matti Bros., 729 South Webster ave., Scranton, Pa.
Bartlett Milk Station, M. S.	Bartlett, N. Y.	Levy Dairy Co., 320 Avenue A, New York City.
Bennett, W. J., B. & C.	Holland Patent	W. J. Bennett
Blake, C.	Taberg, N. Y., R. F. D.	J. Karlen & Son, Rome, N. Y.
Blanchard Creamery, B. & C.	Vernon, N. Y., R. F. D. 1	Mrs. J. S. Blanchard.
Blossvale, No. 19, C.	Blossvale, N. Y.	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Blossvale Milk Station, M. S.	Blossvale, N. Y.	E. E. Stiles.
Blossvale or White Factory, C.	Taberg, N. Y., R. F. D. 2	J. Karlen & Son, Rome, N. Y.
Blue Brook, C.	Ava, N. Y.	David Karlen, Boonville, N. Y.
Boonville, B. & C.	Boonville, N. Y.	McLeod & Ormsbee, 9 Liberty st., Utica, N. Y.
Boonville Milk & Cream Co., M. S.	Boonville, N. Y.	Frank J. Merry.
Borden's Condensed Milk Co., M. S.	Vernon, N. Y.	J. M. Ryan.
Bridgewater, M. S.	Bridgewater, N. Y.	Phenix Cheese Co., South Edmeston, N. Y.
Brodock Factory, C.	Blossvale, N. Y., R. F. D.	A. Brodock.
Brookfield Factory, C.	Taberg, N. Y., R. F. D.	J. Karlen & Son, Rome.

ONEIDA COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Buckhill, C	Westernville, N. Y., R. F. D. 1	J. Karlen & Son, Rome, N. Y.
Camden Creamery, Inc., B. & C.	Camden, N. Y	Henry Jones.
Camden Milk Station, M. S	Camden, N. Y	C. F. Bartlett.
Christen, A., C	Florence, N. Y	C. A. Bartell.
Chuckery, M. S	New York Mills, N. Y	W. C. Risley.
Churchville, C	Verona, N. Y., R. F. D	Fred Bachman.
Clinton Milk Station, M. S	Clinton, N. Y	S. W. Raymond.
Clover Leaf Creamery, B. & C	Remsen, N. Y	B. K. Brown's Son Co.
Coburn Creamery, M. S	Rome, N. Y	C. O. Coburn, 708 Beacham ave.
Colburn, C	Camden, N. Y	J. Karlen & Son, Rome.
Cold Spring, C	Holland Patent, N. Y., R. F. D	Otto Youngi.
Cold Spring Milk Station, M. S	New York Mills, N. Y	W. C. Risley.
Columbia Square Creamery, M. S	1222 Whitesboro st., Utica, N. Y	Andrew Wiber, 1222 Whitesboro st.
Conway, C	Remsen, R. F. D	Sam Kappler, Lee Center.
Cooney, C	Taberg, N. Y., R. F. D. 1	J. Karlen & Son, Rome, N. Y.
Coonrad, C	Rome, N. Y., R. F. D. 1	J. Karlen & Son.
Cornish, C	Lee Center, N. Y	Ankin Bros.
Deerfield Center, B. & C	Deerfield, N. Y., R. F. D. 2	Jas. P. Brown's Son, 417 Main st., Utica, N. Y.
Deerfield Creamery, B. & C	Barneveld, N. Y., R. F. D. 1	C. J. Cotton.
Delaney Creamery, T. B., M. S	Rome, N. Y	T. B. Delaney, 502 James st.
Dix, C	Rome, N. Y	Joseph Schmidt.
Doxtater, C	Durhamville, N. Y	Sam Kappler, Lee Center.
Dunn Brook, C	Boonville, N. Y., R. F. D. 4	J. Karlen & Son, Rome, N. Y.
East Steuben, M. S	East Steuben	Levy Dairy Co., New York City.
Edell, C	Rome, N. Y., R. F. D	Sam Kappler, Lee Center.
Elpis, C	West Vienna, N. Y	Ralph Stevens.
Empire State Dairy Co., M. S	Boonville, N. Y	B. D. Boyce.
Ferman, C	Boonville, N. Y., R. F. D. 6	Walter Ferman.
Flagg & Baker Creamery, M. S	Rome, N. Y	Flagg & Baker, 431 West Thomas st.
Flint Brook, C	Boonville, N. Y., R. F. D	John Ruchti.
Florence Hill, C	Florence, N. Y	Edward Clark, Westdale.
Floyd Corners, C	Stittville, N. Y., R. F. D. 1	J. Karlen & Son, Rome.
Floyd Hill, C	Holland Patent, N. Y., R. F. D	Albert Roscup, Remsen, N. Y., R. F. D.
Francis, M. S	Remsen, N. Y	Lieberman Dairy Co., 56-58 Boerum st., Brooklyn, N. Y.
Frenchville, C	Westernville, N. Y., R. F. D	J. Karlen & Son, Rome, N. Y.
Gleasman, C	Boonville, N. Y., R. F. D	Fred Zwahlen.
Glenmore, B. & C	Glenmore, N. Y	Joseph Hopper, Glenmore.
Glenmore, No. 27, C	Glenmore, N. Y	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Goodsell's Creameries, M. S	Rome, N. Y	B. B. Goodsell, 210 North James st., 330 West Court st.

ONEIDA COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Green's Crossing, M. S.	Cassville, N. Y.	Standard Dairy Co., 611-613 East 12th st., New York City.
Greenway Milk Station, M. S. & C.	Verona, N. Y.	Model Dairy Milk & Cream Co., J. L. Carver.
Griff Thomas, C.	Rome, N. Y., R. F. D. 4.	Sam Kappler, Lee Center.
Harlem Dairy Products Co., M. S.	Clinton, N. Y.	Harlem Dairy Products Co., New York City.
Hawkens Corners Factory, C.	Rome, N. Y.	Chas. D. Ankin.
Hecla Milk Station, M. S.	Westmoreland, N. Y.	National Dairy Co., 358 Oakland st., Brooklyn, N. Y.
Hennessy, C.	Camden, N. Y., R. F. D.	John F. Hennessy.
Highland Mills, C.	Rome, N. Y.	Chas. D. Ankin.
Hillsboro, C.	Camden, N. Y., R. F. D. 2	Seymour Spoon.
Hillside, C.	Boonville, N. Y., R. F. D. 4.	J. Karlen & Son, Rome, N. Y.
Hillside Union, C.	North Western, N. Y.	Union Stock Co.
Holland Patent, M. S. & C.	Holland Patent, N. Y.	Hamilton Dairy Co., 410 West 127th st., New York City.
Honondaga, C.	Remsen, N. Y.	B. K. Brown & Son Co.
Houghton Factory, B. & C.	Camden, N. Y., R. F. D. 3	Merritt Houghton.
Hubbard, C.	Holland Patent, N. Y., R. F. D. 4.	Alfred Blum.
Hurlburt, C.	Rome, N. Y., R. F. D. 6.	Chas. D. Ankin.
Hyde, C.	Rome, N. Y.	Sam Kappler, Lee Center.
Ingersoll, John, C.	Alder Creek, N. Y.	Wm. Roscup, Remsen, N. Y., R. F. D.
Jackson Hill, C.	Boonville, N. Y., R. F. D. 5	David Karlen.
Kinery Dairy, M. J., M. S.	Utica, N. Y.	M. J. Kinery, 20 Kirkland st.
Kirkland Branch, C.	Camden, N. Y., R. F. D. 5	Jas. Kirkland.
Kirkland Creamery Co., B.	Kirkland, N. Y.	Elmer C. Austin.
Knoxboro Creamery, B.	Knoxboro, N. Y.	E. G. Smith.
Lee Center, C.	Lee Center, N. Y.	Sam Kappler.
Lee Center No. 17, C.	Lee Center, N. Y.	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Lee Center No. 30, C.	Lee Center, N. Y.	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Lockwood, A. L., M. S.	Utica, N. Y.	A. L. Lockwood, 1225 Park ave.
Lowell Butter & Cheese Factory, B. & C.	Rome, N. Y., R. F. D. 7.	George Storck.
Marcy Milk Station, M. S.	Marcy, N. Y.	L. E. Tousley.
Marshall Milk Station, M. S.	Cassville, R. F. D.	R. L. Davis.
Merry Factory, G., B. & C.	Verona, N. Y.	F. H. Merry.
Mitchell Creamery, M. S.	New York Mills, N. Y.	Jas. Mitchell.
Mohawk Condensed Milk Co., Cond.	Deansboro, N. Y.	W. J. Mapes, Mgr.
Moore Creamery, William, M. S.	Rome, N. Y.	Wm. Moore, 121 North Washington st.
Mullen Hill, C.	West Branch, N. Y., R. F. D.	J. Karlen & Son, Rome, N. Y.
New London, C.	New London, N. Y.	Albert Sinn.
North Bay, C.	North Bay, N. Y.	J. Karlen & Son, Rome, N. Y.
North Bridgewater, M. S.	Cassville, N. Y., R. F. D.	J. D. Kelly.
North Deerfield Creamery, B. & C.	Deerfield, N. Y., R. F. D.	Stephen Steuber.
North Steuben, C.	Remsen, N. Y.	J. D. Karlen, Boonville, N. Y.

ONEIDA COUNTY—*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
North Western, C	North Western, N. Y.	J. Karlen & Son, Rome, N. Y.
Ohms Factory, C	Boonville, N. Y., R. F. D. 4	Sam Karlen.
Oneida Castle, M. S	Oneida Castle, N. Y	Guy McArthur.
Oriskany Creamery, B	Oriskany, N. Y	H. G. Putnam.
Oriskany Milk Station, M. S.	Oriskany, N. Y	E. B. Shayler.
Paris Hill Creamery, B	Paris, N. Y	Perry G. Smith.
Perry's Creamery, M. S	101 Court st., Utica, N. Y.	W. M. Perry.
Plank Road, C	Boonville, N. Y	W. F. Karlen.
Point Rock, C	Point Rock, N. Y	Sam Kappler, Lee Center.
Porter, C	Remsen, N. Y., R. F. D. 1	Sam Kappler, Lee Center.
Prospect Junction Milk Station, M. S	Prospect, N. Y	F. J. Roberts.
Quaker Hill, C	West Branch, N. Y	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Rathbun, C	Verona, N. Y., R. F. D. 1	J. Karlen & Son.
Rebe, C	West Branch, N. Y	Sam Kappler, Lee Center.
Redmond, B. & C	Boonville, N. Y., R. F. D.	McLeod & Ormsbee, 9 Liberty st., Utica, N. Y.
Remsen Milk Station, M. S	Remsen, N. Y	Walter Brown.
Rider & Co., J. C., M. S	Bridgewater, N. Y	Jas. C. Rider, 102 Norman ave., Brooklyn, N. Y.
Ridge Mills, C	Rome, N. Y., R. F. D.	Chas. Hayes.
Riverside Creamery, B. & C	Oriskany, N. Y	Knauer & Kelly.
Rome No. 12, C	Rome, N. Y., R. F. D.	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Roser, C	Ava, N. Y	D. Karlen, Rome.
Ruegsegger Factory, C	Rome, N. Y., R. F. D. 7	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Sauer Factory, C	Glenmore, N. Y., R. F. D.	J. Karlen & Son, Rome, N. Y.
Sauquoit Milk Station, M. S	Sauquoit, N. Y	Standard Dairy Co., 611-613 East 12th st., New York City.
Sauquoit Valley Creamery, B	Washington Mills, N. Y.	A. Knauer, 511 Columbia st., Utica, N. Y.
Scheidelman Creamery, M. S	Varick st., Utica, N. Y.	F. Scheidelman.
Seminole Condensed Milk Co., Cond	Holland Patent, N. Y	Seminole Condensed Milk Co.
Shean Factory, C	Glenmore, N. Y	Frank Read.
South Trenton, B. & C	South Trenton, N. Y	McLeod & Ormsbee, 9 Liberty st., Utica, N. Y.
South Western, B. & C	North Western, N. Y	Frank Turck, Holland Patent.
Spring Brook, C	Boonville, N. Y	J. M. Sorensen.
Star Hill, C	Remsen, N. Y., R. F. D.	Wm. Roscup.
Star Hill, C	Remsen, N. Y., R. F. D.	Sam Kappler, Lee Center, N. Y.
Starr Factory, C	Rome, N. Y	Chas. D. Ankin.
State Bridge, C	Durhamville, N. Y., R. F. D. 1	J. Karlen & Son, Rome, N. Y.
State Bridge, M. S	Durhamville, N. Y., R. F. D.	Wm. Hilton.
Steuben Center, C	Remsen, N. Y	P. C. Mills.
Stittsville Milk Station, M. S	Stittville, N. Y	Jas. Pelno.
Stokes Factory, C	Stokes, N. Y	J. Karlen & Son, Rome, N. Y.
Stokes, No. 6, C	Stokes, N. Y	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.

ONEIDA COUNTY—*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Stokes, No. 29, C	Stokes, N. Y	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y..
Stone Road Milk Station, M. S	Cassville, N. Y	J. D. Young.
Struen, C	Lee Center, N. Y	Hasselbeck Cheese Co., 596 Jefferson st., Buffalo, N. Y.
Taberg, B. & C	Taberg, N. Y	Fred Bartell.
Teuscher, G., C	Rome, N. Y., R. F. D. 2	David Teuscher.
Thornton, C	Boonville, N. Y., R. F. D. 4	Sam Karlen.
Trenton Milk Station, M. S. & C	Barneveld, N. Y	Eve Jones.
Utica Sanitary Milk Co., M. S	Utica, N. Y	A. R. Hatfield.
Vernon Center Sanitary Dairy Co., B. & C	Vernon Center, N. Y	L. Jay Dunham, Treasurer.
Vernon Dairy Co., M. S	Vernon, N. Y	Otto Bazell.
Verona Station, M. S	Verona Station, N. Y	George Dann.
Vienna Shipping Station & Creamery, B. & C	Vienna, N. Y	Arthur Grant.
Walker Road, B. & C	Deerfield, N. Y	Wm. Scheidelman.
Waterbury, C	Camden, N. Y., R. F. D. 4	Jas. Kirkland.
West Branch, C	West Branch, N. Y	David Karlen, Rome.
West Branch No. 21, C	West Branch, N. Y	Hasselbeck Cheese Co., 59 Jefferson st., Buffalo, N. Y.
West Canada Creek, B. & C	Poland, N. Y	Samuel Baird.
Westdale Milk Station, M. S	Westdale, N. Y	E. P. Seaman, Westdale.
West Vienna, C	West Vienna, N. Y	Raymond Watson.
Whaley Creamery, J. H., B	Higginsville, N. Y	J. H. Whaley, Rome, N. Y.
White Factory, C	Stokes, N. Y	J. Karlen & Son, Rome.
Wilcott Hill, C	Camden, N. Y	S. Ankin, Lee Center.
Williams Creamery, M. S	Rome, N. Y	Thos. Williams, 313 South James st.
Willow Valley, C	Boonville, N. Y	John D. Karlen.
Wilson, C	Taberg, N. Y	Ankin Bros., Lee Center.
Wood Creek, C	Rome, N. Y., R. F. D	Sam Kappler, Lee Center.

ONONDAGA COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Amber Factory, B	Amber, N. Y	Louis J. Edmger.
Apulia, M. S	Fabius, N. Y	Fabius Creamery Co.
Baldwinsville Factory, B	Baldwinsville, N. Y	Garret & Snell.
Baldwinsville, M. S	Baldwinsville, N. Y	Seiler Bros., 272 Plain st., Newark, N. J.
Belgium Factory, C	Belgium, N. Y	H. C. Stebbins.
Brewerton Factory, C	Brewerton, N. Y	F. E. Kellogg.
Borodino Factory, B	Stafford, N. Y	Frank Harvey, Marietta, N. Y., R. F. D. 1.
Camillus Factory, B	Camillus, N. Y	Dennis J. De Lancy; N. Y., R. F. D. 2.
Cicero Factory, C	Cicero, N. Y	E. M. Mills.
Cicero Center Cheese Factory, C	Clay, N. Y	James Chandler.
Clark Factory, B	Marcellus, N. Y	H. I. Clark.
Clay Center Factory, C	Euclid, N. Y	Wm. Blanchard.
Cloverland Dairy Co., M. S	Syracuse, N. Y	Bronson H. Hawkins, President, 250 Lincoln ave.
Delphi Falls Condensery, Cond	Delphi Falls, N. Y	Hornell Condensed Milk and Cream Co., 8th and Provost sts., Jersey City, N. J.

ONONDAGA COUNTY—*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Eureka Factory, B	Marcellus, N. Y	Edson D. Gillett, Skaneateles, N. Y.
Fayetteville Factory, B	Fayetteville, N. Y	Fayetteville Milk Products Co.
Fabius Factory, B	Fabius, N. Y	Fabius Creamery Co.
Hart Lot Factory, B	Hart Lot, N. Y	Wm. G. Cottle.
Jamesville, M. S	Jamesville, N. Y	Laemile Dairy Co., 202 Bleecker st., New York City.
Jordan Factory, B	Jordan, N. Y	John H. Leurs.
Kirkville, M. S	Kirkville, N. Y	Standard Dairy Co., 611–613 East 12th st., New York City.
Lysander Factory, B	Lysander, N. Y	Kelly Bros.
Memphis Factory, B	Memphis, N. Y	W. J. Savage.
National Milk Sugar Co., M. S	Fabius, N. Y	L. R. Scherson, 11 Pine st., New York City.
Navarmo Factory, B	Marcellus, N. Y., R. F. D. 5	J. F. E. Oster.
Netherland Farms Dairy, Inc., M. S	Syracuse, N. Y	Netherland Farms Dairy, Inc., 102 Standard st.
Onatavia Milk Station, M. S	La Fayette, N. Y., R. F. D. 1	Seiler Brothers, 272–274 Plane st., Newark, N. J.
Onondaga Hill Milk Station, M. S	Onondaga, N. Y	E. T. Hawkins & Sons, 250 Lincoln ave., Syracuse, N. Y.
Oran Milk Station, M. S	Manlius, N. Y	Tietgen Bros., 508 East 118th st., New York City.
Otisco Center Butter Factory, B	Otisco, N. Y	C. P. Edinger.
Otisco Valley Skim Station, Sk. Sta.	Spafford, N. Y	Spafford Creamery Co.
Otisco Butter Factory, B	Otisco, N. Y	Earl T. Harter.
Plainville Butter Factory, B	Plainville, N. Y	D. S. Van Derveer.
Pompey Butter Factory, B	Pompey, N. Y	Fabius Creamery Co., Fabius, N. Y.
Pompey Center Milk Station, M. S.	Manlius, N. Y	Tietgen Bros., 508 East 118th st., New York City.
Samson's, M. S	Samson, N. Y	John Bosch's Sons, 163 Ellery st., Brooklyn.
Skaneateles Butter Factory, B	Skaneateles, N. Y	Skaneateles Creamery Co.
Spafford Butter Factory, B	Spafford, N. Y	Spafford Creamery Co.
Speich Butter Factory, B	Marcellus, N. Y., R. F. D. 2	E. J. Speich.
Side Hill Skim Station, M. S	Spafford, N. Y	Spafford Creamery Co.
Tully Milk Station, M. S	Tully, N. Y	Tully Milk Co.
Vesper Cheese Factory, C	Tully, N. Y	Vesper Creamery Association.
Warner's Butter Factory, B	Baldwinsville, N. Y	Otto Snyder.
Watervalle Milk Station, M. S	Manlius, N. Y	Tietgen Bros., 508 East 118th st., New York City.

ONTARIO COUNTY

Bristol Valley Dairy Assn., B	Bristol Center, N. Y	Dr. E. P. McDowell.
Geneva Co., M. S	Geneva, N. Y	Geneva Milk Co.
Port Gibson Factory, B	Port Gibson, N. Y	W. F. Garlock.
White Springs Farm Dairy Co., M. S	Geneva, N. Y	J. Murray Means.

ORANGE COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Borden's, M. S.	Wallkill, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Slate Hill, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Unionville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Burnside, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Florida, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Johnsons, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Kipps Station, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Middletown, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	New Milford, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Otisville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Pine Bush, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's M. S.	Sugar Loaf, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Washingtonville, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S.	Westtown, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's M. S.	Wisner, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Brewster, M. S.	East Coldenham, N. Y.	John Lynch.
Circleville, M. S.	Circleville, N. Y.	I. N. Hump.
Clinton, M. S.	Rocklet, N. Y.	Terroner Clark.
Coldenham, M. S.	Coldenham, N. Y.	William Lee.
Crystal Run, M. S.	Crystal Run, N. Y.	Fred Wolpmann.
Chester Factory, B. & C.	Chester, N. Y.	W. A. Lawrence.
Clarks Station, M. S.	Unionville, N. Y.	Nicossia Bros.
Goshen Condensary, Cond.	Goshen, N. Y.	Howell Bros.

ORANGE COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Goshen Condensary, Cond	Goshen, N. Y	Orange Milk Association, 138 West 31st st., New York City.
East Walden, M. S	Walden, N. Y	Locust Farm Dairy Co., 511 East 35th st., New York City.
East Walden, M. S	Walden, N. Y	Hudson Valley Dairy Co., Newburgh, N. Y.
Little Britain, M. S	Little Britain, N. Y	Ludwig Plasch.
Maybrook, M. S	Mavbrook, N. Y	C. Van Harwood.
Montgomery, M. S	Montgomery, N. Y	H. McWhorter.
Monroe Factory, C	Monroe, N. Y	The Monroe Cheese Factory.
Monroe, M. S	Monroe, N. Y	Thomas McClure.
Mountainville, M. S	Mountainville, N. Y	E. LaBrens.
Neelytown, M. S	Montgomery, N. Y., R. F. D	M. H. Renken Dairy Co., 131 Emerson pl., Brooklyn, N. Y.
New Hampton, M. S	New Hampton, N. Y	Diamond Dairy Co., Carlton ave. and Pacific st., Brooklyn, N. Y.
Otterkill, M. S	Goshen, N. Y., R. F. D	M. H. Renken Dairy Co., 1313 Emerson pl., Brooklyn, N. Y.
Otterkill, M. S	Goshen, N. Y	M. Burgman Dairy Co.
Oxford Depot, M. S	Munroe, N. Y	Alex. Campbell Milk Co., 802 Fulton st., Brooklyn, N. Y.
Port Orange, M. S	West Brookville, N. Y	C. Merts, 60 Stanhope st., Brooklyn, N. Y.
Rocklett Station, M. S	Rock Tavern, N. Y	Leroy Dairy Co.
Salisbury Mills, M. S	Salisbury Mills, N. Y	J. C. Hamlin.
S. F. S. D. Co., M. S	Blooming Grove, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Bullville, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Middletown, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Pounds Station, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Slate Hill, M. S	Slate Hill, N. Y	Clover Farm Dairy.
Stamford, M. S	Stony Ford, N. Y	M. Burgmann.
Thompson Ridge, M. S	Thompson Ridge, N. Y	Reed Ice Cream Co.
Unionville, M. S	Unionville, N. Y	W. Richman.
Warwick, M. S	Warwick, N. Y	Central Dairy Co., 226 East 103d st., New York City.
Westown, M. S	Middletown, N. Y	W. A. Thorne.
Willow Grove, M. S	Newburgh, N. Y., R. F. D. 4	C. L. Merrit.

ORLEANS COUNTY

Barre Factory, C	Albion, N. Y., R. F. D. 3	W. H. Stoney, Jr.

OSWEGO COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Amboy Center Cooperative Cheese Factory, C	Williamstown, N. Y	Frank Bryant.
Altmar Factory, C	Altmar, N. Y	Altmar Butter and Cheese Association, Inc.
Altmar Milk Station, M. S	Altmar, N. Y	Howell Milk and Cream Co., Jersey City, N. J.
Bernhards Milk Station, M. S	Bernhards, N. Y	C. M. Pierce.
Bowens Corners Milk Station, M. S.	Fulton, N. Y., R. F. D. 8	Keystone Dairy Co., 636 Madison st., Hoboken, N. J.
Caughdenoy Milk Station, M. S	Caughdenoy, N. Y	M. Smith, 1 Gouverneur st., New York City.
Cedarville Cheese Factory, C	Williamstown, N. Y., R. F. D	Seymour Spoon, Camden, N. Y., R. F. D. 2.
Central Square Milk Station, M. S.	Central Square, N. Y	Cook Milk & Cream Co., 234 Power st., Brooklyn, N. Y.
Daysville Milk Station, M. S	Pulaski, N. Y., R. F. D	Central Dairy Co., 326 East 103d st., New York City.
D. P. A. Castor Plant, B	Pulaski, N. Y	P. M. Murray, Secretary.
East Palermo Butter & Cheese Association, B. & C	Central Square, N. Y	H. W. Bradford, Manager, Hastings, N. Y.
Farmers Cheese & Butter Co., C	Colosse, N. Y	E. E. Filkins.
Fernwood Milk Station, M. S	Pulaski, N. Y	Central Dairy Co., 326 East 103d st., New York City.
Fulton Milk Station, M. S	Fulton, N. Y	Standard Dairy Co., New York City.
Greenboro Cheese Factory, C	Lacona, N. Y., R. F. D	Bern Yerdon.
Hannibal Cheese Factory & Creamery, B. & C	Hannibal, N. Y	E. B. Tucker & Co.
Hess Cheese Factory, B. & C	West Amboy, N. Y	Arthur V. Beaupre.
Holmes Plant, C	Pulaski, N. Y	Dairymen's Protective Association.
Howardville Cheese Factory, C	Altmar, N. Y	H. H. Gaddis.
Ingalls Crossing, C	Fulton, N. Y., R. F. D. 6	G. D. Trimble & E. M. Hopkins.
Ingersoll Cheese Factory, B. & C	Lacona, N. Y	E. M. Ingersoll.
Lacona Milk Station, M. S	Lacona, N. Y	Empire State Dairy Co., 502 Broadway, Brooklyn, N. Y.
Lakeside Cheese Factory, C	Oswego, N. Y., R. F. D	W. W. Rounds, President.
Mallory Cheese Factory, C	Mallory, N. Y	J. Mallory & Son.
Mapleview Milk Station, M. S	Pulaski, N. Y., R. F. D	Central Dairy Co., 326 East 103d st., New York City.
Mayflower, B	West Monroe, N. Y	H. E. Potter.
Mayflower Cheese Factory, C	Williamstown, N. Y., R. F. D	W. J. Peach, Pulaski, N. Y.
Mexico Milk Station, M. S	Mexico, N. Y	Central Dairy Co., 326 East 103d st., New York City.
Miller Cheese Factory, J. H., C	Lacona, N. Y	W. J. Peach, Pulaski, N. Y.
Minetto Milk Station, M. & C	Oswego, N. Y	Beakes Dairy Co., 206 East 12th st., New York City.
Mount Pleasant Creamery, M. & C.	Fulton, N. Y., R. F. D	Beakes Dairy Co., 206 East 12th st., New York City.
New Centerville Milk Station, M. S.	Richland, N. Y	J. E. McElroy, 320 East 28th st., New York City.
New Haven Cheese Factory, C	New Haven, N. Y	Herman Stoddard.

OSWEGO COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
New Haven, M. S.	Demster, N. Y.	Oliver Clemons.
Nestle Food Co., M. Chocolate	Fulton, N. Y.	Italo Archilli, Superintendent.
North Volney, C.	Mexico, N. Y., R. F. D. 4.	G. S. Cole.
Oneida River Cheese Factory, C.	Caughdenoy, N. Y.	A. P. Merriam, Phoenix, N. Y.
Orwell Butter & Cheese Factory, B. & C.	Orwell, N. Y.	M. E. Burgdorf, Orwell, N. Y.
Palermo, C.	Fulton, N. Y., R. F. D. 4.	G. D. Trimble.
Parish Center Cheese Factory, C.	Parish, N. Y.	Leroy Grant.
Parish Milk Station, M. S.	Parish, N. Y.	Central Dairy Co., 326 East 103d st., New York City.
Peets Corners Receiving Station, M. S.	Central Square, N. Y., R. F. D.	M. Smith, 1 Gouverneur st., New York City.
Pennellville Milk Station, M. S.	Pennellville, N. Y.	Beaks Dairy Co., 206 East 12th st., New York City.
Phoenix Cheese Factory, C.	Phoenix, N. Y.	Barneskey & Peacock.
Pulaski Milk Station, M. S.	Pulaski, N. Y.	Carl Robb.
Ricard Cheese Factory, C.	Altmar, N. Y.	J. C. Cromsen.
Rosemary Creamery or The Dry Milk Co., M. S.	Mexico, N. Y.	W. J. Parks, Manager.
Salisbury & Peach Factory, C.	Pulaski, N. Y.	W. J. Peach.
Salt Road Cheese Factory, C.	Williamstown, N. Y.	Clarence McLaughlin.
Scriba Center Creamery Co., B. & C.	Oswego, N. Y., R. F. D. 2.	Loren Isbell, Manager.
Shoecraft Butter & Cheese Factory, B. & C.	Lacona, N. Y., R. F. D.	M. E. Shoecraft.
South Granby Milk Station, M. S.	South Granby, N. Y.	Keystone Dairy Co., 636 Madison st., Hoboken, N. J.
South Hannibal Butter & Cheese Co., B. & C.	Fulton, N. Y.	Fred. N. Palmer.
Stevens Cheese Factory, A. M., C.	Lacona, N. Y., R. F. D.	A. M. Stevens.
Union Butter & Cheese Co., B. & C.	Sandy Creek, N. Y.	W. J. Peach, Pulaski, N. Y.
Vermillion Dairy & Milk Products Co., B. & C.	Mexico, N. Y., R. F. D. 3.	Elmer E. Berry, New Haven, N. Y., R. F. D.
West Monroe Milk Station, M. S.	West Monroe	Cook Milk & Cream Co., 234 Powers st., Brooklyn, N. Y.
Williamstown Cheese Factory, C.	Williamstown, N. Y.	Charles Kirkland.
Williamstown Shipping Sta., M. S.	Williamstown, N. Y.	Hauk Dairy Co., 12 Clinton st. Yonkers.

OTSEGO COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Ayer & McKinney Creamery, B.	Laurens, N. Y.	F. M. Hand.
Brainards Corners Cheese Factory, B., C. & M.	Burlington Flats, R. F. D.	Phoenix Cheese Co., 345 Greenwich st., New York City.
Briar Creek, B. & C.	Otego, N. Y.	Briar Creek Creamery Co., Inc., 84 Delevan st., Walton, N. Y.
Brick School House Factory, C.	Burlington Flats, N. Y., R. F. D.	E. W. Wright.
Brockway No. 1, C.	Richfield, N. Y.	Geo. T. Brockway.
Burlington Flats, M. S.	Burlington Flats, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.

OTSEGO COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Burlington Flats Cheese Co., No. 2	Burlington Flats, N. Y.	W. E. Davis, President; J. D. Fitch, Secretary.
Cherry Valley Cheese Factory, C.	Cherry Valley, N. Y., R. F. D.	C. P. Root's Sons, Gilbertsville, N. Y.
Clarksville, C.	Middlefield, N. Y.	H. C. McRorie.
Cold Spring Creamery, B. & C.	Springfield Center, N. Y.	James A. Gow.
Decatur Cheese Factory, C.	Worcester, N. Y., R. F. D.	C. P. Root's Sons, Gilbertsville, N. Y.
Dimmick Hollow Cheese Factory, C		Fitz Gilbert, Jr., & Co., Gilbertsville, N. Y.
East Worcester, M. S.	East Worcester, N. Y.	Sheffield Farms, Slawson, Decker Co., 524 West 57th st., New York City.
Edmeston, M. S.	Edmeston, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Edmeston Milk Station, M. S.	Edmeston, N. Y.	Lieberman Dairy Co., 56 and 58 Bowerman st., Brooklyn.
German Cheese Factory	Fly Creek, N. Y.	August Ausmuth.
Gilberts Creamery, B. & C.	Gilbertsville, N. Y.	Fitz Gilbert, Jr. Co.
Gilmore Cheese Factory, C.	Burlington Flats, N. Y., R. F. D. 1	Hiram A. Gilmore.
Gregory, S. C., C.	Mt. Vision, N. Y.	C. J. Thorpe, Secretary.
The Haith Creamery, C.	East Springfield, N. Y.	A. C. Haith.
Hinman Hollow, C.	Milford, N. Y.	W. A. Kiley, Cooperstown, N. Y.
Huntley, C.	West Winfield, N. Y., R. F. D.	Phoenix Cheese Co., 345 Greenwich st., New York City.
International Milk Products Co., B., C. & C.	Cooperstown, N. Y.	W. W. Hadley.
Kileys Cheese Factory, C.	Cooperstown, N. Y.	Walter A. Kiley.
Laemile Dairy Co., Inc., M. S.	Maryland, N. Y.	Walter D. Scott, Manager.
Lena Creamery, C.	Hartwick, N. Y., R. F. D.	E. R. Hunt, Morris, N. Y.
Lentsville, C.	Cooperstown, N. Y.	R. G. Tuller.
McDermott Dairy Co., M. S.	Unadilla, N. Y.	N. E. Weidman, Manager.
Maple Grove, C.	Gilbertsville, N. Y.	J. H. Eilbert & Co.
Maple Valley, C.	Westford, N. Y.	P. D. Roseboom.
Morris Station, B. & C.		Fitz Gilbert Jr., & Co., Gilbertsville, N. Y.
Mt. Vision Cooperative Creamery, B.	Mt. Vision, N. Y.	C. H. Matteson, Secretary.
New Lisbon, C.	New Lisbon, N. Y.	R. G. Peet, Mt. Vision, N. Y.
O'Connell, C.	Cooperstown, N. Y., R. F. D.	Thomas F. O'Connell.
Oneonta Dairy Co., B. & M.	Oneonta, N. Y.	E. L. Hall, Manager.
Otego Milk Station, M. S.	Otego, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Pashleys, C.	Burlington, N. Y.	G. C. Pashley.
Patent Factory, C.	Hartwick, N. Y.	Smith Jenks, Secretary.
Phoenix Mills Milk Station, B., C. M.	Cooperstown, N. Y., R. F. D.	Max Blum, 142 Read st., New York City.
Pine Apple Cheese Factory, B. & C.	Milford, N. Y.	O. A. Weatherly & Co.

OTSEGO COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Plainfield Union Cheese Factory, C.	West Winfield, N. Y., R. F. D. 2	Phoenix Cheese Co., 345 Greenwich st., New York City,
Pleasant Brook Factory, C	Pleasant Brook, N. Y	C. P. Root's Sons, Gilbertsville, N. Y.
Pleasant Valley, C	Hartwick, R. F. D	Geo. T. Brockway, Richfield, N. Y.
Portlandville Milk Station, M. S.	Portlandville, N. Y	R. F. Stevens Co., 90, 94 Third ave., Brooklyn, N. Y.
Richfield, B. & M	Richfield Springs, N. Y	The Rockdale Co., Howard M. Curtis, Manager.
Rider Cheese Factory, J. J., C	Schuyler Lake, N. Y	Geo. J. Rider.
River Meadow Farm, C	Portlandville, N. Y	McLaury Bros.
Rockdale Co., M. S	Cherry Valley, N. Y	Benj. Wightman.
Rock Spring Creamery, C	East Springfield, N. Y	A. C. Haith.
Roots Home Cheese Factory, C	Gilbertsville, N. Y	C. P. Roots Sons.
Sand Hill, B. & C	Wells Bridge, N. Y	Briar Creek Creamery Co., Inc., 84 Delevan st., Walton, N. Y.
Schenevus Milk Station, M. S	Schenevus, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Schuyler Lake, M. S	Schuyler Lake, N. Y	International Milk Products Co., Cooperstown, N. Y.
Shamrock Cheese Factory, C	Gilbertsville, N. Y	Charles M. Freer.
Snyder Cheese Factory, C	Cherry Valley, N. Y	Elmer Snyder.
South Edmeston, B., C. & M	South Edmeston, N. Y	Phoenix Cheese Co., 345 Greenwich st., New York City.
South Hartwick Factory, C	Milford, N. Y., R. F. D.	C. P. Root's Sons, Gilbertsville N. Y.
South Valley, C	South Valley, N. Y	C. P. Root's Sons, Gilbertsville, N. Y.
South Worcester Milk Station, M. S.	South Worcester, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Stanley, C	Cherry Valley, N. Y	T. F. O'Connell, Cooperstown, N. Y.
Stevens Corners, C	Mt. Vision, R. F. D	A. S. Stevens.
Unadilla Creamery Co., B	Unadilla, N. Y	Knott & Southworth.
Wellsbridge Milk Station, M. S	Wells Bridge, N. Y	McDermott Dairy Co., 91 Manhattan st., New York City,
Westford Cheese Factory, C	Westford, N. Y	C. E. McRorie.
West Laurens Creamery, B	West Laurens, N. Y	C. P. Root's Sons, Gilbertsville, N. Y.
Westville, C	Schenevus, N. Y., R. F. D.	C. P. Root's Sons, Gilbertsville, N. Y.
West Edmeston, M. S	Edmeston, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
West Exeter, B., C. & M	West Exeter, N. Y	Phoenix Cheese Co., 345 Greenwich st., New York City.
White House, C	Hartwick, N. Y	R. D. Lamb.
Wilmarth, C	Richfield Springs, R. F. D.	Geo. T. Brockway.
Worcester, M. S	Worcester, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Young, L. D., C	Warren, N. Y	Lester Young.

PUTNAM COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Baldwin Place, M. S	Baldwin Place, N. Y	Central Dairy Co., 326 East 103d st., New York City.
Borden's, M. S	Brewster, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Carmel, M. S	Carmel, N. Y	John Overfield.
McElroy Creamery, M. S	Dykemans, N. Y	John McElroy.
S. F. S. D., M. S	Patterson, N. Y	Sheffield Farms, Slawson, Decker Co., 524 West 57th st., New York City.
Towners, M. S	Towners, N. Y	Central Dairy Co., 326 East 103d st., New York City.

RENSSELAER COUNTY

Berlin Milk Condensing Co., Cond.	Berlin, N. Y	J. H. Slatterlie.
Brunswick Creamery, B	Eagle Mills, N. Y	L. B. Thurston, Troy, N. Y., R. F. D. 3.
Buskirk, M. S	Buskirk, N. Y	D. Whiting & Sons, Boston, Mass.
Eagle Bridge Milk Station	Eagle Bridge, N. Y	H. P. Hood & Sons, Boston, Mass.
Hoosick Elgin System Creamery, B.	Hoosick, N. Y	John Mosely.
Johnsonville, M. S	Johnsonville, N. Y	D. Whiting & Sons, Boston, Mass.
Nassau Milk Station	Nassau, N. Y	Locust Farms Co., 551 East 35th st., New York City.
Petersburgh, Sk. Sta	Petersburgh, N. Y	
S. F. S. D. Co., M. S	West Hoosick, N. Y	Sheffield Farms, Slawson, Decker Co., 524 West 57th st., New York City.

ST. LAWRENCE COUNTY

Apple Grove Butter & Cheese Factory, B. & C	Canton, N. Y	Perry Eggleson.
Beckelhaupt, No. 1, C	South Hammond, N. Y	A. Beckelhaupt, Redwood, N. Y.
Beech Grove, B	Hermon, N. Y	G. Montroy.
Beech Grove, B. & C	Hermon, N. Y., R. F. D. 1.	Daniel Harmer.
Bell Creamery, B	Brasher Falls, N. Y	W. E. Bell.
Belleville, B. & C	Edwards, N. Y	S. E. Collier, Hermon, R. F. D. 2.
Brandy Brook, B	Waddington	N. S. Dickinson.
Brasie Corners, B. & C	Brasie Corners, N. Y	Weatherup & McCadam.
Brier Hill, C. & M	Brier Hill, N. Y	A. Koester, 438 West 58th st., New York City.
Buckton Creamery, B	Winthrop, N. Y	John Chambers.
Burnhams Corners, B., C. & M	Burnhams Corners, N. Y.	Phoenix Cheese Co., New York City.
Calaboga Factory, C	South Hammond, N. Y	C. J. Shoulette, Philadelphia, N. Y.
California, B. & C	Gouverneur, N. Y	J. W. Rees.
Canton Condensery, B. & M	Canton, N. Y	McDermott Dairy Co., 91 Manhattan st., New York City, Jas. Dondon, Manager.
Cedar Grove, B. & C	Morristown, N. Y	John Greeley.
Centennial, B	Ogdensburg, N. Y	Leo Murphy.

ST. LAWRENCE—*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Center Cheese Factory, B. & C.	Morristown, N. Y.	Leon Overacker.
Champion, B. & Cr	Madrid, N. Y.	Thos. F. Rutherford.
Chase Mills, B., C. & M	Chase Mills, N. Y.	Hamilton Dairy Co., 410 West 127th st., New York City.
Cheshire, B. & C	De Kalb Junction	Levi J. Sipher, Canton, N. Y.
Clare Cheese Factory, C	Clare, N. Y	M. E. Cotton, DeGrasse, N. Y.
Clover Hill, B. & C	Pope Mills, N. Y	M. C. Johnson.
Cold Spring, C	Harrisville, N. Y., R. F. D. 2	Clarence Hunt.
Cold Spring Factory, B. & C	Gouverneur, N. Y	E. J. Stevenson.
Colton, B., C. & M	Colton, N. Y	Phoenix Cheese Co., New York City.
Converse Creamery, B	Winthrop, N. Y	H. A. Bullard.
Cooks Corners, C	Colton, N. Y., R. F. D. 1	Edwin Cooke.
Cottage Grove, B. & C	Hermon, N. Y	C. E. Western.
Crass Creek Factory, C	South Hammond, N. Y	James Judge, Oxbow, N. Y.
Cream of the Valley, B. & C	Gouverneur, N. Y	A. W. Overacker.
Crystal Spa, B., C. & M	Crystal Spa, N. Y	Phoenix Cheese Co., New York City.
De Kalb, B. & C	De Kalb Jct., R. F. D. 1	Ulysses Sayer.
De Kalb Factory, No. 2 (Pleasant Valley), B. & C	De Kalb Junction, N. Y	Ulysses Sayer.
De Kalb, M. S	De Kalb, N. Y	Borden's Condensed Milk Co., Hudson st., New York City.
De Peyster No. 1, B. C., & M	De Peyster, N. Y	C. E. Griffin.
De Peyster No. 2, B. & C	De Peyster, N. Y	C. E. Griffin.
Depottville, B. & C	South Hammond, N. Y., R. F. D	S. K. Putnam.
Diamond, B. & Cream	Massena, N. Y	J. G. Turnbull Co., Orleans st., New York City.
East De Kalb, C. & M	De Kalb Jct., R. F. D. 2	G. A. Lalone.
East Gouverneur, B. & C	Gouverneur, N. Y	W. A. Freeman.
East Lisbon, B. & C	Rensselaer Falls, R. F. D.	E. D. Thompson.
Eben, C	Canton, N. Y., R. F. D	Phoenix Cheese Co., New York City.
Edwards Station, M. S	Edwards, N. Y	Interstate Milk & Cream Co., 325 East 111th st., New York City.
Elm Creek Cheese Factory, C	Hermon, N. Y	W. C. Smith.
Elmdale Cheese Factory, C	Gouverneur, N. Y	Fred W. Campbell.
Elm Grove, B. & C	Richville, N. Y	C. G. Van Atter.
Elm Grove Butter & Cheese, B. & C	Ogdensburg, N. Y	John Cooper.
Farmers' Company of West Stockholm, B. & C	West Stockholm, N. Y	C. W. Jenner, Secy.
Fayville, B. & C	Canton, N. Y	Earl H. Wood.
Fish Creek, B. & C	Heuvelton, N. Y., Star Route	Giffin & Gilson.
Five Corners Creamery, B	Potsdam, N. Y	E. B. Adams.
Flackville, C	Ogdensburg, R. F. D. 1	G. C. Fuller.
Fort Jackson Creamery, B	Fort Jackson, N. Y	Glenn L. Ketcham.
Fowler, B, C	Gouverneur, N. Y	W. Overacker.
Frontier, B. & C	Ogdensburg, N. Y	Wm. Long.
Gilt Edge, B	Madrid, N. Y	Adam E. Fisher.

ST. LAWRENCE—*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Gouverneur Cheese Factory No. 1. B. & C.	Gouverneur, R. F. D. 6	Jesse Wood.
Grass River Creamery, B. & C.	Madrid Springs, N. Y.	M. L. Speer.
Griffith Butter & Cheese Factory, B. & C.	Heuvelton, N. Y.	W. J. Reed, Gouverneur, N. Y., R. F. D. 2.
Hailesboro Cheese & Butter Factory, B. & C.	Hailesboro, N. Y.	A. Whitton, Gouverneur, N. Y.
Hammond Milk Station, M. S.	Hammond, N. Y.	T. O. Smith Sons, 872 Sixth ave., New York City.
Heuvelton Butter & Cheese Factory, B. & C.	Heuvelton, N. Y.	Mrs. W. J. Mills.
Hickory Lake Cheese Factory, C.	De Peyster, N. Y.	Orsa Stevenson.
Highland, B. & C.	Canton, N. Y.	M. E. Meservey.
Horton Ice Cream Co., J. M., B. & M.	Richville, N. Y.	J. M. Horton Ice Cream Co., 205 East 24th st., New York City.
Howard, B. & C.	Rensselaer Falls, N. Y.	T. W. Weatherup, Brasie Corners, N. Y.
Hudson Condensed Milk Co., Cond.	Hermon, N. Y.	B. Sharpe, Superintendent.
Ideal Creamery, B.	Lisbon, N. Y.	R. H. Keyes.
International Milk Products Co., B. & M.	Gouverneur, N. Y.	A. H. Cross, Manager.
Jennie Creek, C.	Harrisville, N. Y., R. F. D. 2	Perley Kinnie.
Jerusalem, B. & C.	DeKalb Jct., N. Y.	Geo. Griffith.
Johnstown Street Cheese Factory, B. & C.	Gouverneur, R. F. D.	Abner N. Freeman.
Keystone, B. & M.	Lisbon, N. Y.	C. A. Dawley.
Lake Shore, B. & C.	Hammond, N. Y.	W. J. Townsend.
Langdon Spring Creamery, B.	Canton, N. Y.	L. P. Lewis.
Lawrenceville Creamery, B.	Lawrenceville, N. Y.	L. L. Dewey.
Lisbon Milk Station (includes Excelsior, Receiver), M. & C.	Lisbon, N. Y.	William Michaelson, 410 West 127th st., New York City.
Long Rapids, B. & C.	Morley, N. Y.	W. O. Goodison.
Madrid Springs Milk Station, M. S.	Madrid, N. Y.	Central Dairy Co., 326 East 103d st., New York City.
Massena Springs Condensery, C. & Cond. M.	Massena, N. Y.	Beakes Dairy Co., 206 East 12th st., New York City.
Mayflower Cheese Factory, C.	Massena, N. Y.	C. J. Williams.
Meadowside Creamery, B.	Winthrop, N. Y.	Elliott Burk & Co.
New Century, B. & C.	Ogdensburg, N. Y., R. F. D. 3	Isaac Creighton.
Newfield Cheese Factory, C.	Hammond, N. Y.	Henry J. Shoulette.
Norfolk Milk Station, M. S.	Norfolk, N. Y.	Hamilton Dairy Co., 410 West 127th st., New York City.
North Lawrence Milk Station, M. S.	North Lawrence, N. Y.	Levy Dairy Co., 320, 322 Avenue A, New York City.
North Lisbon Gilt Edge Creamery, B.	Lisbon, R. F. D.	H. J. Randles, 110 Jay st., Ogdensburg, N. Y.
North Russell, B. & C.	Russell, N. Y., R. F. D.	W. C. Poole.
Oakvale Station, C. & M.	South Hammond, N. Y.	George Petrie.

ST. LAWRENCE — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Ogdensburg Creamery, B	Ogdensburg, N. Y	Ogdensburg Creamery Co.
Osborne Lake, B. & C	Gouverneur, N. Y., R. F. D	A. W. Overacker.
Oswegatchie, B. & C	Ogdensburg, N. Y., R. F. D. 3	T. H. Thornton.
Parishville, B., C. & M	Parishville, N. Y	Phoenix Cheese Co., New York City.
Parishville Cooperative Creamery Co., B	Parishville, N. Y	Royal Newton, President.
Pine Hill, C	Gouverneur, N. Y., R. F. D	T. W. Weatherup, Brasie Corners, N. Y.
Pleasant Valley, B., C. & M	Pleasant Valley, N. Y	Phoenix Cheese Co., New York City.
Pleasant Valley, C	Talcville, N. Y	Mandon Woodward.
Plum Brook, M. S	Plum Brook, N. Y	Tietjen Bros., 506-508 East 118th st., New York City. E. J. Williams, Mgr. Plumbrook, N. Y.
Plumb Creek, C	Russell, N. Y	Geo. M. Given.
Potsdam, B., C. & M	Potsdam, N. Y	Phoenix Cheese Co., New York City.
Potsdam Milk Products Co., B	Potsdam, N. Y	Allen M. Thurston, President.
Potsdam Milk Station, M. S	Potsdam, N. Y	Locust Farms Dairy, New York City.
Red Star, C	Richville, N. Y	C. F. Woods.
Rensselaer Falls, B., C. & M	Rensselaer Falls, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Rock Bottom, C	Richville, N. Y	D. E. Gilson & S. A. Beach, Heuvelton, N. Y.
Rose Bud, B. & C	Hermon, N. Y	C. E. Western.
Rossie Factory, B. & C	Rossie, N. Y	C. J. Shoulette, Philadelphia, N. Y.
Royal, B. & C	Heuvelton, N. Y	Jas. W. Thraves.
Ruby, B. & C	Pope Mills, N. Y	T. W. Weatherup, Brasie Corners, N. Y.
Russell Village, B. & C	Russell, N. Y	A. D. Frawley.
St. Lawrence, C	Brier Hill, N. Y	John M. Dodds.
Schofield Factory, B. & C	De Kalb Jct., R. F. D. 2	Clarence E. Wood.
Scotch Settlement Factory, C	South Hammond, N. Y., R. F. D	G. W. Evans, Secy.
Settlemen, C	Canton, N. Y., R. F. D	L. J. Sipher.
South Canton Creamery, B. C	Canton, N. Y	A. M. Pike, Secretary.
South Colton Creamery, B	South Colton, N. Y	G. A. Lindsay.
South Gouverneur, C	Gouverneur, R. F. D	Ranford Stevenson.
South Hermon, C	Gouverneur, R. F. D. 4	J. P. Morse.
Southville Creamery, B	Potsdam, N. Y	L. R. Nye.
Spaulding Creamery, B	Madrid Springs, N. Y	J. E. Beswick.
Spragueville, B. & C	Spragueville, N. Y	John H. Berry.
Steeles Corners, C	Spragueville, N. Y	John H. Berry.
Sucher Brook Milk Station, C. & M	Madrid, N. Y	Hamilton Dairy Co., 410 West 127th st., New York City.
Summerville, C	Gouverneur, N. Y	John Dugan.
Sunrise, B. & C	Ogdensburg, N. Y	W. J. Murphy.

ST. LAWRENCE — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Sylvia Lake, C	Spragueville, R. F. D. 1	D. E. Parker, Gouverneur, R. F. D. 1.
Tanner Creek, B., C. & M	De Kalb Junction	N. E. Faribanks.
1000 Island, C	Chippewa Bay, N. Y	D. F. Babcock.
Thousand Islands Farms, Inc., B. & C	Morristown, N. Y	Frank L. Scot.
Trout Lake, C	Hermon, N. Y	H. G. Chandler, Ogdensburg. Harry Davis, Hermon, Mgr.
Unique Creamery, B	Lisbon, N. Y	George Widrick.
Village Creamery, B. & M	Norwood, N. Y	T. P. Grant, 9 Fulton Place, Boston, Mass.
Waddington Condensery	Waddington, R. F. D. 1	Hamilton Dairy Co., 410 West 127th st., New York City.
Wegatchie, C	Gouverneur, N. Y., R. F. D. 5	Albert Salmon.
West Canton, B. & C	Canton, N. Y., R. F. D	L. J. Sipher.
West Hermon, B. & C	De Kalb Jct., R. F. D. 3	B. E. Hunt.
West Howard, B. & C	Rensselaer Falls, N. Y., R. F. D. 2	Jessie Wood.
West Pierrepont, B. & C	West Pierrepont, N. Y	C. J. McNeil.
West Potsdam, B., C. & M	West Potsdam, N. Y	Phoenix Cheese Co., New York City.
West Stockholm, B., C. & M	West Stockholm, N. Y	Phoenix Cheese Co., New York City.
White Clover, C	Fine, N. Y,	W. A. Royce, Sharon Center, O.
Wildwood, C	Colton, N. Y., R. F. D. 2	O. S. Russell.
York State Creamery, B	Helena, N. Y	Lantry, McIntyre & Lantry.
Zoller Bros. Co., B. & C	Hammond, N. Y	Zoller Bros. Co., Schenectady, N. Y.

SARATOGA COUNTY

Borden's, M. S	Gansevoort, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Ballston Spa. Creamery, B	Ballston Spa. N. Y	C. S. Gilbert.
A creamery reported to be back of Schuylerville, B	Schuylerville, N. Y	A. C. Lottridge.
Stillwater Creamery, Cry	Stillwater, N. Y	W. R. Edwards.
Kings Creamery, B	Kings, N. Y	Clarence Latham.

SCHENECTADY COUNTY

Delanson Cooperative Creamery, B	Delanson, N. Y	C. E. Washburn.
Pattersonville Cry., B	Pattersonville, N. Y	Frank A. Wilcox

SCHOHARIE COUNTY

Argusville Factory, C	Argusville, N. Y	C. P. Root's Sons, Gilbertsville, N. Y.
Bates Hollow, Sk. Sta	Preston Hollow, N. Y	A. S. Coons.
Borden's, M. S	Middleburgh, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Sharon Springs, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City,
Borden's, M. S	Sharon Hill, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.

SCHOHARIE COUNTY—*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Borden's, M. S.	Schoharie, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Broome Centre Creamery, B.	Gilboa, N. Y., R. F. D.	Franklin Clapper.
Carlisle Cooperative Creamery, B.	Carlisle, N. Y.	Carlisle Cooperative Creamery Co.
Charlotteville Elgin Creamery Co., B.	Charlotteville, N. Y.	Hiram Haner.
Conesville, Sk. Sta.	Manorville, N. Y.	J. B. Hawver.
Flat Creek, Sk. Sta.	Gilboa, N. Y.	Gilboa Creamery Co.
Fairlands, Sk. Sta.	West Fulton, N. Y.	Frank Akeley.
Franklinton Creamery, B.	Middleburgh, N. Y.	K. Foland.
Gallupville Creamery	Gallupville, N. Y.	Geo. Young, Central Bridge N. Y., R. F. D. 1.
Gilboa Creamery, B.	Gilboa, N. Y.	Gilboa Creamery Co.
Hunter's Land Cooperative Creamery, B.	Middleburgh, N. Y., R. F. D. 2.	Jerone Decker.
Jefferson Creamery, B.	Jefferson, N. Y.	Joseph H. Gilmore.
Jerome, Sk. Sta.	Summit, N. Y.	A. L. Jump.
Lutheranville, Sk. Sta.	Charlotteville, N. Y.	Hiram Haner.
Manorkill Creamery, B.	Manorkill, N. Y.	J. B. Hawver.
Mutual Milk & Cream Co., M. S.	South Gilboa, N. Y.	Mutual Milk & Cream Co., 2146 East 22d st., New York City.
Pine Grove Creamery, B.	Middleburgh, N. Y., R. F. D. 2.	Orlin Decker.
Rose Creamery, M. S.	Cobleskill, N. Y.	Chas. Rose & Son.
Rose Creamery, B.	North Blenheim, N. Y.	Chas. Rose & Son.
S. F. S. D. Co., M. S.	Central Bridge, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S.	Cobleskill, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S., Grade A.	Cobleskill, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S.	Howe Cave, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S.	Hyndsville, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S.	Richmondville, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S.	Seward, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S.	West Richmondsville, N. Y.	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
Sloansville Creamery, B.	Sloansville, N. Y.	
Snyder Factory, C.	Sharon Springs, N. Y.	Alonzo C. Snyder.
Summit Cooperative Creamery, B.	Summit, N. Y.	A. L. Jump.
West Fulton Cooperative Creamery, B.	West Fulton, N. Y.	Frank Akeley.

SEHUYLER COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Alpine, C.	Alpine, N. Y.	J. L. Richards.
Alpine, M. S.	Alpine, N Y.	Beakes Dairy Co., 206 E. 12th st., New York City.
Bennettsburg Logan Co., C.	Bennettsburg, N. Y.	W. & I. Mekeel, Jacksonville, N. Y.
Cayuta, M. S.	Cayuta, N. Y.	J. Max, 195 Livingston st., Newark, N. J.
Cayutaville	Cayutaville, N. Y.	W. & I. Mekeel, Jacksonville, N. Y.
Halpin Bros	Odessa, N. Y.	C. M. Heasley.
Logan, C.	Hector, N. Y.	W. & I Mekeel, Jacksonville, N. Y.

SENECA COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Interlaken Station, M. S.	Interlaken, N. Y.	Richmond Bros. Dairy Co., 154 Maple ave., Rosebank, N. Y.

STEUBEN COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Arkport Creamery Co., C.	Arkport, N. Y.	Horseheads Creamery Co., Horseheads, N. Y.
Avoca Factory, C.	Avoca, N. Y.	Louis U. Coffin.
Brasted District Factory, C.	Hornell, N. Y.	J. A. Meeks, Hornell, N. Y.
Bennetts Creek Factory, C.	Canisteo, N. Y., R. F. D. 1	W. C. Bassett, Canisteo, N. Y.
Big Creek Factory, C.	Fremont, N. Y.	Horseheads Creamery Co., Horseheads, N. Y.
Brown Factory, C.	Andover, N. Y.	Wm. E. Greene, Andover, R. F. D. 2.
Call Hill Factory, C.	Andover, N. Y., R. F. D. 1	W. H. Oaks, 14 Alley, Hornell, N. Y.
Canisteo Factory, C.	Canisteo, N. Y.	E. L. Stephens,.
Cloverdale Factory, B.	Canisteo, N. Y.	E. Ireland.
Cohocton Factory, B.	Cohocton, N. Y.	Penna. Creamery Co., 39 South Water st., Philadelphia, Pa.
Cold Spring Factory, C.	Alfred Station, N. Y.	George M. Grow.
Coodhue Factory, C.	Addison, N. Y.	F. E. Zimmer.
Coopers Plains Factory, B.	Coopers Plains, N. Y.	Fred W. Smith.
Dryden Ridge Factory, C.	Greenwood, N. Y.	J. J. Stooks.
Eureka Factory, C.	Campbell, N. Y.	Rising Bros.
Goodyear, M. S.	379 Third st., Corning, N. Y.	Clair Goodyear.
Green Valley Factory, C.	Addison, N. Y.	Ben D. Casson, East Addison, N. Y.
Greenwood Factory, B.	Greenwood, N. Y.	N. E. Castur.
Highup Factory, C.	Troupsburg, N. Y	F. E. Zimmer, Addison, N. Y.
Higgesville Factory, C.	Woodhull, N. Y., R. F. D.	C. R. Perry.
Hopper Factory, C	Troupsburg, N. Y.	F. E. Zimmer, Addison, N. Y.
Howell, M. S.	Addison, N. Y.	Frank Gould.
Hornell Dairy Co., C	Hornell, N. Y.	E. M. Holmes.
Howard Factory, C.	Howard, N. Y.	Henry McAdam.
Jasper Factory, C.	Jasper, N. Y.	F. E. Zimmer, Addison, N. Y.
Jasper Factory, B.	Jasper, N. Y.	A. A. Button.
June Factory, B.	Hornell, N. Y.	H. I. June.
Mann, M. S.	Corning, N. Y.	W. F. Mann.
Mudcreek Factory, C.	Savona, N. Y.	F. E. Zimmer, Addison, N. Y.
Neils Creek Factory, C.	Cohocton, N. Y.	George Clymo.

STEUBEN COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
North Jasper Dairy Association, C.	Cameron, N. Y., R. F. D. 3	Andrew F. Dennis.
Oregon Factory, C	Cameron, N. Y	F. E. Zimmer, Addison, N. Y.
Pond Factory, C	Avoca, N. Y., R. F. D	Geo. W. Ferris, Wallace, N. Y.
Rexville Factory, C	Rexville, N. Y	Bernhart Murray.
Shovel Hollow Cheese Factory, C.	Andover, N. Y., R. F. D. 1	Lewis Kellinberger.
Sluyter Factory, C	Rexville, N. Y	James McKinley.
Spring Valley Co., B	Hornell, N. Y., R. F. D. 4.	Spring Valley Dairy Co.
Thornbottom Factory, C	Troupsburg, N. Y	F. L. Waight, Jasper, N. Y.
Towlesville Factory, C	Kanona, N. Y	Louis U. Coffin.
Troupsburg Factory, B. & C	Troupsburg, N. Y	Tew, Austin, Grigg & Dempsey.
Tuscarora Factory, C	Addison, N. Y	F. E. Zimmer.
Unionville Factory, C	Bath, N. Y	M. C. McAdam, 135 Morris st., Bath.
Wallace Cheese Factory, C	Wallace, N. Y	Fred Hopkins.
West Jasper Factory, C	Greenwood, N. Y	F. E. Zimmer, Addison, N. Y.
West Rathbone Factory, C	Cameron Mills, N. Y., R. F. D	West Rathbone Cheese Co.
White Clover Factory	Woodhull, N. Y	Menzo Wildrick.
Woodhull Factory, C	Woodhull, N. Y	J. W. McStay.

SULLIVAN COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Beechridge Creamery, B. & C	Stevensville, N. Y	Abraham Canno, 71 Summer ave., Brooklyn, N. Y.
Bethel Creamery, B. & C	Bethel, N. Y	Abraham Canno, 71 Summer ave., Brooklyn, N. Y.
Bloomingburg Factory, C	Bloomingburg, N. Y	Frank Cuomo.
Borden's, M. S	Cochecton, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Boock Brook Creamery, B. & C	North Branch, N. Y	Samuel Katz, 444 Grand st., New York City.
Briscoe, B. & C	Briscoe, N. Y	Joffry & Perlman.
Callicoon, M. S	Callicoon Centre, N. Y	Sullivan County Creamery Co., Jeffersonville, N. Y.
Callicoon Elgin Creamery, B	Callicoon, N. Y	Ross Baldwin.
Centerville, M. S	Centerville Station, N. Y.	E. D. Offen.
Empire State Dairy Co., M. S	Stevensville, N. Y	Geo. Longwell.
Empire State Dairy Co., M. S	Liberty, N. Y	J. M. Morris.
Empire State Dairy Co., M. S	White Sulphur Springs, N. Y	P. Smith.
Evans Dairy Co., W. M., M. S	Winterton, N. Y	W. M. Evans Dairy Co., 32 Lexington ave., Brooklyn N. Y.
Fremont Centre Creamery, C	Fremont Centre, N. Y	Samuel Katz, 444 Grand st., New York City.
Fulboam Creamery, M. S	Milanville, Pa	E. A. Cartheuser.
Fulton Creamery, B	Ferndale, N. Y	A. P. Fulton.
Hankins Creamery, M. S	Hankins, N. Y	Sullivan County Creamery Co., Jeffersonville, N. Y.
Hasbrouck Factory, C	Hasbrouck, N. Y	Johnston & Albee.
Hurleyville, M. S	Hurleyville, N. Y	Johnston & Albee, 204 West 96th st., New York City, N. Y.

SULLIVAN COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Kenosa Lake, M. S.	Kenosa Lake, N. Y.	Sullivan County Dairy Co., Jeffersonville, N. Y.
Koenigs Flat Creamery, B. & C.	Jeffersonville, N. Y.	Abraham Canno, 71 Summer ave., Brooklyn, N. Y.
Luke Blake Creamery, M. S.	High View, N. Y.	E. C. North.
Livingston Manor, M. S.	Livingston Manor, N. Y.	Bert Owens.
Mongaup Valley Creamery, B. & C.	Mongaup Valley, N. Y.	John Mausi.
Narrowsburg, M. S.	Narrowsburg, N. Y.	M. H. Renken Dairy Co., 131 Emerson pl., Brooklyn, N. Y.
Parksville Dairy, B. & C.	Parksville, N. Y.	B. Silverman.
Pinney's Creamery, M. S.	Liberty, N. Y.	E. E. Pinney.
Roscoe, M. S.	Roscoe, N. Y.	Johnston & Albee, 204 West 96th st., New York City.
Wurtsboro, M. S.	Wurtsboro, N. Y.	John Draves Sons, 130 Union st., Union Hill, N. J.
Youngsville Creamery, C.	Youngsville, N. Y.	Samuel Katz, 444 Grand st., New York City.

TOMPKINS COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Caroline Center, Sk. Sta.	Caroline Center, N. Y.	Geo. & Mrs. Bull, Slatersville Springs, N. Y.
Dept. of Dairy Industry, M. S.	Ithaca, N. Y.	B. T. Galloway, Cornell University, Director.
Crystal Fountain, B.	Slaterville Springs, N. Y.	Geo. & Mrs. Bull.
Davis, Sk. Sta.	Ithaca, N. Y., R. F. D. 1.	B. T. Galloway, Cornell University, Director.
Drydens Borden's, M. S.	Dryden, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Dryden Haviland, M. S.	Dryden, N. Y.	E. G. Haviland, 367 Seventh ave., Brooklyn, N. Y.
Etna Factory, B.	Etna, N. Y.	Etna Cooperative Butter & Cheese Factory.
Freeville, M. S.	Freeville, N. Y.	Horseheads Creamery Co., Horseheads, N. Y.
Groton City, M. S.	Groton, N. Y., R. F. D.	Jersey Milk & Cream Co., 351 Morris ave., Newark, N. J.
Groton Factory, B.	Groton, N. Y.	Jersey Milk & Cream Co., 351 Morris ave., Newark, N. J.
Groton, M. S.	Groton, N. Y.	Jersey Milk & Cream Co., 351 Morris ave., Newark, N. J.
Howland, Sk. Sta.	Ithaca, N. Y., R. F. D.	B. T. Galloway, Cornell University.
Ithaca Condensery, Cond.	Ithaca, N. Y.	Slutshauer & Brigsten.
Ithaca Sanitary, M. S.	Ithaca, N. Y.	Fred D. Van Order.
Jacksonville Factory, B.	Jacksonville, N. Y.	W. I. Mekeel.
Lansingville, Sk. Sta.	Lansing, N. Y.	B. T. Galloway, Cornell University, Director, Ithaca, N. Y.
Luce, M. S.	Ithaca, N. Y.	W. A. Luce, 406 Mechanic st.
McLean, M. S.	McLean, N. Y.	H. A. Rusch, 226 Stockholm st., Brooklyn, N. Y.
Newfield Factory, B.	Newfield, N. Y.	High Ground Dairy Co., 447 Madison ave., Brooklyn, N. Y.
Newfield, M. S.	Newfield, N. Y.	Empire Milk & Cream Co., Allentown, Pa.

TOMPKINS COUNTY—*Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR, MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
North Lansing, Sk. Sta.	North Lansing, N. Y.	B. T. Galloway, Cornell University, Director, Ithaca, N. Y.
Peruton, M. S.	Peruton, N. Y.	R. F. Stevens Co., 94 Third ave., Brooklyn, N. Y.
Pearsons Sanitary Factory, M. S. P.	Ithaca, N. Y.	R. S. Pearson, 412 North Geneva st.
Speedsville Factory, B.	Berkshire, N. Y.	Standard Butter Co., Owego, N. Y.
Trumansburg, M. S.	Trumansburg, N. Y.	Cook Milk & Cream Co., 294 Garden st., Brooklyn, N. Y.
West Dryden, Sk. Sta.	West Dryden, N. Y.	B. T. Galloway, Cornell University, Director, Ithaca, N. Y.
West Danby, M. S.	West Danby, N. Y.	R. F. Stevens Co., 94 3rd st., Brooklyn, N. Y.
West Groton, Sk. Sta.	Groton; N. Y.	B. T. Galloway, Cornell University, Director, Ithaca, N. Y

TIOGA COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR, MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Apalachin, M. S.	Apalachin, N. Y.	Henry Rauch, 27 Garden st. Brooklyn, N. Y.
Barton, M. S.	Barton, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Berkshire, M. S.	Berkshire, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Candor, M. S.	Candor, N. Y.	Alex. Campbell, 802 Fulton st., Brooklyn, N. Y.
Catatonk, M. S.	Catatonk, N. Y.	R. F. Stevens, 94 Third ave., Brooklyn, N. Y.
Crines Corners Factory, C.	Candor, N. Y., R. F. D.	Crines Corners Milk Association, Candor, N. Y.
East Berkshire Factory, B.	Berkshire, N. Y.	Joseph Rabenstein, Berkshire, N. Y.
Fairfield Factory, C.	Candor, N. Y.	Fairfield Butter & Cheese Factory.
Flemingville, M. S.	Owego, N. Y., R. F. D.	R. F. Stevens Co., 94 Fourth ave., Brooklyn, N. Y.
Gilt Edge Factory, B.	Owego, N. Y.	Standard Butter Co.
Halsey Valley Factory, B.	Halsey Valley, N. Y.	Standard Butter Co., Owego, N. Y.
Ham, M. S.	Waverly, N. Y.	J. W. Ham, 60 Pine st.
Kitchawanville Factory, B.	Kitchawanville, N. Y.	Standard Butter Co., Owego, N. Y.
Lockwood, M. S.	Lockwood, N. Y.	M. H. Jones.
Lounsberry, M. S.	Lounsberry, N. Y.	Standard Butter Co., Owego, N. Y.
Newark Valley, M. S.	Newark Valley, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Nichols Borden's, M. S.	Nichols, N. Y.	Borden's Condensed Milk Co., 108 Hudson st., New York City.
North Spencer Factory, B.	Spencer, N. Y.	Standard Butter Factory, Owego, N. Y.

TIOGA COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Owego, M. S	Owego, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Richford, M. S	Richford, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Smithboro, M. S	Smithboro, N. Y	R. F. Stevens Co., 88-94 Third ave., Brooklyn, N. Y.
Spencer, M. S	Spencer, N. Y	C. Jetter, 43 Perry st., Newark, N. J.
Spencer Condensery, Cond	Spencer, N. Y	Empire Creamery Co., Allentown, Pa.
Strait Corners Factory, B	Strait Corners, N. Y	Standard Butter Co., Owego, N. Y.
Tioga Center Erie, M. S	Tioga Center, N. Y	572 Greenwich st., New York City.
Tioga Center Lehigh Valley, M. S	Tioga Center, N. Y	L. Smith, 620 South 10th st., Newark, N. J
Waits Skimming Station, Skm. Sta	Waits, N. Y	John Sayre Creamery & Cold Storage Co., Sayre, Pa.
Waverly, M. S	Waverly, N. Y	Fred Hevener.
West Candor, M. S	West Candor, N. Y	E. G. Haviland, 367 Seventh ave., Brooklyn, N. Y.
Wilseyville, M. S	Wilseyville, N. Y	Geo. & Mrs. John Bull, Slatersville Springs.

ULSTER COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Accord, M. S	Accord, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Alligerville, M. S	Alligerville, N. Y.	
Kerhonkson, M. S	Kerhonkson, N. Y	Charles Mertz.
Gardiner, M. S	Gardiner, N. Y	R. F. Stevens Co., 90 Third ave., Brooklyn, N. Y.
Kingston, M. S	Kingston, N. Y	Kingston Dairy & Ice Cream Co.
Modena, M. S	Modena, N. Y	R. F. Stevens, 90 Third ave., Brooklyn, N. Y.
New Hurley, M. S	New Hurley, N. Y	R. F. Stevens, 90 Third ave., Brooklyn, N. Y.
New Paltz, M. S	New Paltz, N. Y	McDermott's Creamery, 127 West 42d st., New York City.
Realyea, M. S	Realyea, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Wallkill, M. S	Wallkill, N. Y	Bordens' Condensed Milk Co., 108 Hudson st., New York City.

WARREN COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Glens Falls Dairy Creamery, B	Glens Falls, N. Y	Frank Herald.
Goss, M. S	Glens Falls, N. Y	W. H. Goss, 7 North Delaware st.

WASHINGTON COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Argyle Creamery, B	Argyle, N. Y	O. L. Kimball.
Black River Factory, C	Salem, N. Y., R. F. D. 2	John T. McClellan.
Borden's, M. S	Fort Ann, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Granville, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Borden's, M. S	Whitehall, N. Y	Borden's Condensed Milk Co., 108 Hudson st., New York City.
Campbell Milk Co., Alex., M. S	Salem, N. Y	Alexander Campbell Milk Co., 802 Fulton st., Brooklyn, N. Y.
Comstock, Sk. Sta	Comstock, N. Y	Tait Bros., Fairhaven, Vt.
Cossayuna Factory, C	Cossayuna, N. Y	Cossayuna Cheese Co.
East Hartford Factory, C	Hartford, N. Y., R. F. D.	Geo. H. Washburn.
East Whitehall, Sk. Sta	Whitehall, N. Y	C. C. Graves Co., Poultney, Vt.
Evans Dairy Co., W. M., M. S	Middle Granville, N. Y	W. M. Evans Dairy Co., 32 Lexington ave., Brooklyn, N. Y.
Goose Island Factory, C	Argyle, N. Y	Robert Sloan, Mgr.
Green Mountain Creamery, B	White Creek, N. Y	Geo. Bouplon, North Bennington, Vt.
Hebron Factory, C	Salem, N. Y., R. F. D. 2.	H. R. Wilson.
Hebron Union Factory, C	Granville, N. Y., R. F. D. 1	A. G. Parker.
Hebron Valley Factory, C	Salem, N. Y., R. F. D. 1.	Hebron Valley Dairy Association.
Hood & Son, H. P., M. S	Middle Granville, N. Y	H. P. Hood & Son, Boston, Mass.
Hood & Son, H. P., M. S	Salem, N. Y	H. P. Hood & Son, Boston, Mass.
Normanskill Farm Dairy, M. S	Greenwich, N. Y	C. P. Stevens, 124–126 Jay st. Albany, N. Y.
North Argyle Factory, C	Argyle, N. Y., R. F. D. 3.	Mrs. Mary E. Shields, Smith's Basin, N. Y., R. F. D. 1.
North Hebron Factory, C	Granville, N. Y., R. F. D.	William Fleming.
Salem Factory, C	Salem, N. Y	A. E. Morehouse.
Sciota, Sk. Sta	Whitehall, N. Y	J. H. Low, Westport, N. Y.
S. F. S. D. Co., M. S	Cambridge, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Fort Edward, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
S. F. S. D. Co., M. S	Smith's Basin, N. Y	Sheffield Farms, Slawson Decker Co., 524 West 57th st., New York City.
South Argyle Factory, C	Argyle, N. Y	A. R. McMorris.
South Easton Factory, C	Valley Falls, N. Y	M. L. Hoffman.
South Hartford Factory, C	South Hartford, N. Y	LeRoy J. Dean.
Whiting & Son, D., M. S	Archdale, N. Y	John Kent, Fly Summit, N. Y.
Whiting & Son, D., M. S	Easton Station, N. Y	D. Whiting & Son, Boston, Mass.
Whiting & Son, D., M. S	Greenwich, N. Y	D. Whiting & Son, Boston, Mass.
Whiting & Son, D., M. S	South Cambridge, N. Y	D. Whiting & Son, Boston, Mass.
White Creek Creamery, B	White Creek, N. Y	S. R. Lake.

WAYNE COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Angel Corners, Skm. Sta.	Clyde, N. Y.	Chas. Walchoff.
Butler Center, Skm. Sta.	South Butler, N. Y.	William E. Hall.
Clyde Factory, B.	Clyde, N. Y.	E. C. Burt.
Hunt's Corners, Skm. Sta.	Clyde, N. Y., R. F. D.	W. L. Smith.
Huron Factory, C.	Wolcott, N. Y.	Chas. Killicutt.
Lyons Factory, B.	Lyons, N. Y.	A. H. Kanouse.
Macedon Factory, C.	Macedon, N. Y.	Ralph Cuomo.
Marengo, Skm. Sta.	Clyde, N. Y.	Chas. Bicknell.
Newark Co., C.	Newark, N. Y.	Newark Creamery Co.
North Wolcott, Skm. Sta.	Wolcott, N. Y.	A. S. Chamlin.
Port Gibson, B.	Port Gibson, N. Y.	Wm. Garlock.
Red Creek, C.	Red Creek, N. Y.	A. S. Chaplin, Wolcott, N. Y.
Savannah Factory, B.	Savannah, N. Y.	William E. Hall, Butler, N. Y.
Sodus Cooperative Co., B.	Wolcott, N. Y.	H. Chapman.
South Butler, B. & C.	South Butler, N. Y.	W. E. Hall.
Spring Lake, Skm. Sta.	Spring Lake, N. Y.	W. E. Hall, South Butler, N. Y.
Wayne County Milk Product Co., M. S.	Ontario Center, N. Y.	H. W. Rich, 401 Beckley Bldg., Rochester, N. Y.
Westbury, Skm. Sta.	Red Creek, N. Y.	A. S. Chaplin, Wolcott, N. Y.
Williamson Milk Product Co., M. S.	Williamson, N. Y.	H. W. Rich, 401 Beckley Bldg., Rochester, N. Y.
Wolcott, C.	Wolcott, N. Y.	A. S. Chaplin.

WESTCHESTER COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Golden's Bridge, M. S.	Golden's Bridge, N. Y.	Locust Farms Co. 458 Tenth ave., New York City.
Shrub Oak, M. S.	Shrub Oak, N. Y.	William Crawford.
Van Cortland, M. S.	Peekskill, N. Y.	E. F. Lockwood, 407 Highland ave.

WYOMING COUNTY

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Arcade Factory, Cry.	Arcade, N. Y.	Merrell & Soule Co., Syracuse, N. Y.
Bennington Factory, C.	Varysburg, N. Y.	Geo. E. Hogue, Arcade, N. Y.
Bennington Factory, C.	Bennington, N. Y.	Richardson-Beebe Co., East Aurora, N. Y.
Castile Co., Cry.	Castile, N. Y.	J. Harry Van Arsdale.
Cluney Factory No. 1, B. & C.	Attica, N. Y.	F. E. Cluney.
Cluney Factory No. 2, C.	Johnsonburg, N. Y.	F. E. Cluney.
Cluney Factory No. 3, C.	Warsaw, N. Y.	F. E. Cluney.
Cowlesville, Skm. Sta.	Cowlesville, N. Y.	Richardson-Beebe Co., East Aurora, N. Y.
Cowlesville Association, C.	Cowlesville, N. Y.	E. E. Parson.
Dutch Flats Factory, C.	Attica, N. Y.	Geo. E. Hogue, Arcade, N. Y.
Elmont, Skm. Sta.	Cowlesville, N. Y.	Richardson-Beebe Co., East Aurora, N. Y.
Fosier Factory, C.	Sheldon, N. Y.	Richardson-Beebe Co., East Aurora, N. Y.
Gainesville Co., B. & C.	Gainesville, N. Y.	F. M. Bristol.
Glov Factory, C.	Warsaw, N. Y.	Geo. Brandbrooks, Attica, N. Y.
Hasselbeck Cheese Co. No. 1, C.	Attica, N. Y.	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.

WYOMING COUNTY — *Continued*

NAME OF PLANT	P. O. ADDRESS	PROPRIETOR OR MANAGER AND P. O. ADDRESS WHEN DIFFERENT FROM FACTORY ADDRESS
Hasselbeck Factory No. 3, C......	Attica, N. Y............	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.
Hasselbeck Factory No. 4, C......	Darien, N. Y...........	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.
Hasselbeck Factory No. 5, C......	Varysburg, N. Y........	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.
Hasselbeck Factory No. 7, C......	Varysburg, N. Y........	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.
Hasselbeck Factory No. 10, C.....	Strykersville, N. Y......	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.
Hasselbeck Factory No. 11, C.....	Attica, N. Y............	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.
Hasselbeck Factory No. 14, C.....	Cowlesville, N. Y........	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.
Hasselbeck Factory No. 22, C.....	Strykersville, N. Y......	Hasselbeck Cheese Co., 596–606 Jefferson st., Buffalo, N. Y.
Hermitage Factory, C............	Gainesville, N. Y........	C. W. Rissinger.
Hermitage Factory, C............	Gainesville, N. Y........	A. U. Stedman.
Java Factory, B.................	Java, N. Y.............	Richardson–Beebe Co., East Aurora, N. Y.
Java Center Factory, B..........	Java Center, N. Y.......	Richardson-Beebe Co., East Aurora, N. Y.
Java Lake Factory, C............	Arcade, N. Y...........	George E. Hogue.
Java Village Factory, B..........	Java Village, N. Y.......	Richardson–Beebe Co., East Aurora, N. Y.
Johnsonburg Factory, C..........	Johnsonburg, N. Y......	Geo. E. Hogue, Arcade, N. Y.
Mud Valley Factory, C..........	North Java, N. Y.......	Geo. E. Hogue, Arcade, N. Y.
North Java Association, B. & C...	North Java, N. Y.......	John Perl.
North Sheldon Factory, C........	Strykersville, N. Y......	Richardson-Beebe Co., East Aurora, N. Y.
Oak Hill Factory, B.............	Silver Springs, N. Y.....	D. M. Calkins.
Park Cheese Factory, C.	Attica, N. Y............	Robert Norton & Co.
Perry Factory, C................	Johnsonburg, N. Y.......	Geo. E. Hogue, Arcade, N. Y.
Portageville Factory, C..........	Portageville, N. Y.......	E. W. Bull.
Queen of the Valley Factory, C....	Varysburg, N. Y........	Richardson-Beebe Co., East Aurora, N. Y.
Sheldon Factory, B..............	Strykersville, N. Y......	Frank Fuller.
Smiths Corners Factory, C.......	Bliss, N. Y............	Geo. E. Hogue, Arcade, N. Y.
South Sheldon Factory, C........	Java Center, N. Y.......	Richardson-Beebe Co., East Aurora, N. Y.
Springbrook Co., B. & C.........	Silver Springs, N. Y.....	E. F. Baier.
Star Factory, C..................	Johnsonburg, N. Y......	Geo. E. Hogue, Arcade, N. Y.
Strykersville Factory, B..........	Strykersville, N. Y......	F. G. Gerhardt.
Varysburg Factory, C............	Varysburg, N. Y........	Geo. E. Hogue, Arcade, N. Y.
Wyoming Co., B.................	Wyoming, N. Y.........	W. A. Hawley.

YATES COUNTY

The Dundee Factory, C..........	Dundee, N. Y...........	J. W. Strowbridge,.

MILK DEALERS LICENSED UNDER SECTION 55 OF AGRICULTURAL LAW, FOR THE YEAR ENDING SEPTEMBER 1, 1915

License No.	NAME	Organization	Address
1	Sheffield Farms-Slawson Decker Co.	Corporation	524 West 57th st., New York City.
2	F. X. Baumert & Co	Partnership	177 Franklin st., New York City.
3	Newark Milk & Cream Co	Corporation	Canisteo, N. Y.
4	The Rosemary Creamery Co	Corporation	11 Pine st., New York City.
5	Andes Creamery Co	Corporation	Andes, N. Y.
6	Joseph Rabenstein	Individual	Berkshire, N. Y.
7	Theodore F. Lawrence	Individual	Chester, N. Y.
8	Henry M. Schwarz	Individual	422 East 118th st., New York City.
9	Charles H. Helmers	Individual	Cassville, N. Y.
10	Crystal Fountain Creamery	Partnership	Slaterville Springs, N. Y.
11	Franklin County Creamery & Condensed Milk Company	Partnership	North Bangor, N. Y.
12	Sodus Cooperative Creamery Co	Corporation	Wolcott, N. Y.
13	Ogdensburg Creamery Co	Corporation	210 State st., Ogdensburg, N. Y.
14	Fitch Gilbert, Jr. & Co	Corporation	Gilbertsville, N. Y.
15	Royal Dairy Co	Corporation	665 Lake st., Elmira, N. Y.
16	Delhi Cooperative Dairy Co	Corporation	Delhi, N. Y.
17	Willow Brook Dairy, Inc	Corporation	209 Washington st., Mt. Vernon, N. Y.
18	Hornell Sanitary Dairy Co. Inc	Corporation	Hornell, N. Y.
19	Edward J. Byrnes	Individual	Merrifield, N. Y.
20	John H. Satterlee, trading as Berlin Milk Condensing Co	Individual	Berlin, N. Y.
21	Atwater Brothers	Partnership	401 Division st., Elmira, N. Y.
22	Wetmiller Brothers	Partnership	Cohocton, N. Y.
23	John Draves' Sons	Partnership	Wurtsboro, N. Y.
24	Henry Dolfinger	Individual	Nunda, N. Y.
25	F. Hoover & Son	Partnership	Sterlingville, N. Y
26	Eugene P. Norton, trading as Robert Norton & Co	Individual	Attica, N. Y.
27	Andrew Knauer, trading as Sauquoit Valley Dairy	Individual	351 Columbia st., Utica, N. Y.
28	Oneonta Dairy Co	Corporation	26 Main st., Oneonta, N. Y.
29	Frank Karlen	Individual	West Branch, N. Y.
30	Gardner & Doscher	Partnership	343 West 38th st., New York City.
31	John H. Lewis, trading as Jordan Creamery	Individual	Jordan, N. Y.
32	Edgar Shoemaker	Individual	615 East 134th st., New York City.
33	Isaac Cohen	Individual	16 Moore st., Brooklyn, N. Y.
34	Joseph Israel	Individual	34 Norfolk st., New York City.
35	Charles G. Stretch	Individual	Killawog, N. Y.
36	Herman Stuhring	Individual	322 West. 48th st., New York City.
37	Joanna M. Clark	Individual	Ensenore, N. Y.
38	John Ruchti	Individual	Ava, N. Y.
39	Elle E. Pinney	Individual	Liberty, N. Y.
40	Henry A. Rusch	Individual	226 Stockholm st., Brooklyn, N. Y.
41	Louis Kadans	Individual	306 Greenwich st., New York City
42	Hamilton Dairy Co	Corporation	620 West 131st st., New York City
43	Standard Dairy Co	Corporation	611 East 12th st., New York City.

MILK DEALERS LICENSED UNDER SECTION 55 OF AGRICULTURAL LAW, FOR THE YEAR ENDING SEPTEMBER 1, 1915 — *Cont'd*

License No.	NAME	Organization	Address
44	Louis Edelstein	Individual	48 Seigel st., Brooklyn, N. Y.
45	Henry Arnstein	Individual	101 West 140th st., New York City.
46	Harvey G. Putnam, trading as Oriskany Creamery	Individual	Oriskany, N. Y.
47	William Jorden	Individual	Guilford Center, N. Y.
48	Fred Wolpmann	Individual	Randallsville, N. Y. (P. O. Earlville N. Y.)
49	Wm. Slottman	Individual	23 Mangin st., New York City.
50	Otto Heuer	Individual	Earlville, N. Y.
51	Jos. H. Gilmore	Individual	Jefferson, N. Y.
52	Otto Gruhn	Individual	223 Boerum st., Brooklyn, N. Y
53	John E. Rosasco	Individual	13 Morton st., New York City.
54	John F. Hager	Individual	Leroy, N. Y.
55	Harry B. Livermore	Individual	Moravia, N. Y.
56	Broesemer & Gleason	Partnership	170 West First st., Oswego, N. Y.
57	Springfield Farms Co., Inc	Corporation	Springfield Center, N. Y.
58	Phenix Cheese Co	Corporation	345 Greenwich st., New York City
59	Nestle's Food Co. Inc	Corporation	555 South Fourth st., Fulton, N. Y
60	Powdered Milk Co. of America	Corporation	51 Hudson st., New York City.
61	Isaac W. Rushmore Co	Corporation	100 Atlantic ave., Brooklyn, N. Y.
62	West Handsome Brook Cooperative Creamery Co	Corporation	84 Delaware st., Walton, N. Y.
63	Theodore P. Grant, trading as Village Creameries	Individual	Norfolk, N. Y
64	R. F. Stevens Co	Corporation	88 Third ave., Brooklyn, N. Y.
65	Brunson A. Hull	Individual	Middletown, N. Y.
66	The Reid Ice Cream Co	Corporation	524 Waverly ave., Brooklyn, N. Y.
67	Brown & Bailey Condensed Milk Co	Corporation	88 Third ave., Brooklyn, N. Y.
68	Lloyd Creamery Co	Corporation	Oneida, N. Y.
69	Sayre Creamery & Cold Storage Co.	Corporation	Waits, N. Y.
70	Mohawk Condensed Milk Co	Corporation	71 Hudson st., New York City.
71	Genesee Valley Milk Products Co	Corporation	Lakeville, N. Y.
72	Fillmore-Belfast Dairy Products Co. Inc	Corporation	Fillmore, N. Y.
73	Katches Dairy Co	Corporation	444 Grand st., New York City.
74	Chemung Valley Dairy Products Co.	Corporation	Big Flats, N. Y.
75	Alexander Campbell Milk Co	Corporation	802 Fulton st., Brooklyn, N. Y.
76	Briar Creek Creamery Co., Inc	Corporation	Walton, N. Y.
77	M. H. Renken Dairy Co	Corporation	131 Emerson place, Brooklyn, N. Y.
78	John Blumers & Bros	Corporation	535 East 75th st., New York City.
79	H. P. Hood & Sons	Corporation	Eagle Bridge, N. Y.
80	Ullmann & Hauk Dairy Co	Corporation	513 West 131st st., New York City.
81	Central Dairy Co	Corporation	322 East 103d st., New York City.
82	Clover-Dale Farms Co	Corporation	60 Exchange st., Binghamton, N. Y.
83	Silberman Dairy Co	Corporation	80 Vernon ave., Brooklyn, N. Y.
84	The Ekenberg Co	Corporation	Cortland, N. Y.
85	The Richardson-Beebe Co	Corporation	East Aurora, N. Y.
86	Granton Creamery Co	Corporation	Walton, N. Y.
87	Hudson Milk & Cream Co	Corporation	Itaska, N. Y.
88	Hasselbeck Cheese Co	Corporation	596 Jefferson st., Buffalo, N. Y.
89	Crowley's Dairy Products Co., Inc.	Corporation	729 Main st., Poughkeepsie, N. Y.
90	Tully Milk Co., Inc	Corporation	Tully, N. Y.
91	The Empire State Dairy Co	Corporation	502 Broadway, Brooklyn, N. Y.

MILK DEALERS LICENSED UNDER SECTION 55 OF AGRICULTURAL LAW, FOR THE YEAR ENDING SEPTEMBER 1, 1915 — *Cont'd*

License No.	NAME	Organization	Address
92	Cedarville Milk & Cream Co	Corporation	Cedarville, N. Y.
93	Henry Rauch Co	Corporation	27 Garden st., Brooklyn, N. Y.
94	Vito Villecco	Individual	Tunnel, N. Y.
95	Charles O. Cross & Sons	Partnership	Johnstown, N. Y.
96	The Fabius Creamery Co	Corporation	Fabius, N. Y.
97	McDermott Dairy Co	Corporation	91 Manhattan st., New York City.
98	Levy Dairy Co	Corporation	19th st. and Avenue B, New York City.
99	W. & I. Mekeel	Partnership	Jacksonville, N. Y.
100	Domser Brothers	Partnership	Boonville, N. Y.
101	Samuel Fieldman	Individual	618 East 9th st., New York City.
102	Tietjen Brothers	Partnership	506 East 118th st., New York City.
103	Cornelius Van Herwarde	Individual	Maybrook, N. Y.
104	David Whiting & Sons	Partnership	Greenwich, N. Y.
105	Harvey J. June	Individual	305 Main st., Hornell, N. Y.
106	Evan L. Jones	Individual	Delevan, N. Y.
107	Clayton A. Buckingham	Individual	New Woodstock, N. Y.
108	Parksville Dairy Co	Partnership	Parksville, N. Y.
109	Fort Plain Milk Co., Inc	Corporation	Fort Plain, N. Y.
110	W. J. & H. R. Fraser	Partnership	Fraser, N. Y.
111	Tait Brothers	Partnership	138 West 31st st., New York City.
112	Charles N. Smith, trading as Fort Plain Dairy Kitchen	Individual	Fort Plain, N. Y.
113	William Richman	Individual	Unionville, N. Y.
114	Mutual Milk & Cream Co	Corporation	214 East 22d st., New York City.
115	J. M. Horton Ice Cream Co	Corporation	205 East 24th st., New York City.
116	Luke Blake	Individual	959 Sixth ave., New York City.
117	Rockland Creamery Co	Partnership	Rockland, N. Y.
118	Adam Bickelhaupt	Individual	Redwood, N. Y.
119	Queen City Dairy Co	Corporation	251 Seneca st., Buffalo, N. Y.
120	Seminole Condensed Milk Co	Corporation	Holland Patent, N. Y.
121	Charles Cuomo	Individual	42 Spring st., New York City.
122	T. O. Smith's Sons	Partnership	872 Sixth ave., New York City.
123	Sullivan County Creamery Co	Partnership	Jeffersonville, N. Y.
124	National Dairy Co	Corporation	358 Oakland st., Brooklyn, N. Y.
125	Supplee Alderney Dairy	Partnership	Mayville, N. Y.
126	James C. Rider & Co	Corporation	102 Norman ave., Brooklyn, N. Y.
127	Hauk Dairy Co	Corporation	12 Clinton st., Yonkers, N. Y.
128	Wheat's Ice Cream Co	Corporation	Akron, N. Y.
129	Ithaca Condensed Milk & Cream Co., Inc	Corporation	West Clinton st., Ithaca, N. Y.
130	Modern Dairy Co., Inc	Corporation	868 Dean st., Brooklyn, N. Y.
131	Anton Koester	Individual	438 West 58th st. New York City.
132	Conrad Feige	Individual	557 West 42d st., New York City.
133	Wm. Michaelsen	Individual	410 West 127th st., New York City.
134	Ideal Dairy Co	Corporation	203 20th st., Brooklyn, N. Y.
135	Middle States Creamery Co	Corporation	Canastota, N. Y.
136	Clover Leaf Milk Co	Corporation	175 West Main st., Amsterdam, N. Y.
137	The Monroe Cheese Co	Corporation	Main st., Monroe, N. Y.
138	W. M. Evans Dairy Co., Inc	Corporation	32 Lexington ave., Brooklyn, N. Y.
139	New York Dairy Produce Co	Corporation	155 Freeman st., Brooklyn, N. Y.
140	Ira E. Gifford, trading as Gifford Dairy Co	Individual	Poplar Ridge, N. Y.

MILK DEALERS LICENSED UNDER SECTION 55 OF AGRICULTURAL LAW, FOR THE YEAR ENDING SEPTEMBER 1, 1915 — *Cont'd*

License No.	NAME	Organization	Address
141	William J. Peach	Individual	Pulaski, N. Y.
142	James H. Whaley Creamery Co	Corporation	212 N. Washington st., Rome, N. Y.
143	Cooke Milk & Cream Co	Corporation	294 Graham ave., Brooklyn, N. Y.
144	The Rockdale Co	Corporation	Rockdale, N. Y.
145	Jersey Milk & Cream Co	Corporation	Groton, N. Y
146	Standard Butter Co	Corporation	Owego, N. Y.
147	Russell J. Maneely	Individual	Malone, N. Y.
148	Richard C. Greten	Individual	Blodgett Mills, N. Y.
149	Jefferson County Creamery Co	Corporation	100 Hudson st., New York City.
150	Frank Burton Coons	Individual	Burnt Hills, N. Y.
151	Ambrosia Milk Corporation	Corporation	120 Liberty st., New York City.
152	Riverside Creamery Corporation	Corporation	Warsaw, N. Y.
153	Frederick W. Janssen	Individual	Little York, N. Y.
154	Emanuel D. Offen, trading as Centerville Creamery Co	Individual	Centerville Station, N. Y.
155	John H. Muller	Individual	513 West 55th st., New York City.
156	B. S. Boyd & Co	Partnership	Cannonsville, N. Y.
157	Wm. M. Murray & Co	Partnership	Sempronius, N. Y. (P. O. Moravia, N. Y.
158	Albert C. Haith	Individual	East Springfield, N. Y.
159	The Port Jervis Dairy Co	Partnership	Port Jervis, N. Y.
160	James William Husted	Individual	Peekskill, N. Y.
161	O. A. Weatherly & Co	Partnership	Milford, N. Y.
162	Unadilla Creamery Co	Partnership	Unadilla, N. Y.
163	Horseheads Creamery Co	Corporation	Horseheads, N. Y.
164	Borden's Condensed Milk Co	Corporation	108 Hudson st., New York City.
165	High Ground Dairy Co	Corporation	447 Madison st., Brooklyn, N. Y.
166	Seiler Brothers	Partnership	Baldwinsville, N. Y.
167	Frank Francis	Individual	Malone, N. Y.
168	Sam Tevelowitz	Individual	Ellenville, N. Y.
169	Arkport Creamery Co	Corporation	Arkport, N. Y.
170	Breakstone Brothers, Inc	Corporation	344 Greenwich st., New York City.
171	International Milk Products Co	Corporation	Cooperstown, N. Y.
172	Albert C. Ogden	Individual	Middletown, N. Y.
173	Cloverland Dairy Co., Inc	Corporation	250 Lincoln ave, Syracuse, N. Y.
174	John Manzi	Individual	Mongaup Valley, N. Y.
175	Charles D. Anken	Individual	Rome, N. Y.
176	Albert E. Doane	Individual	Marathon, N. Y. R. D. 6
177	Orange County Milk Association	Corporation	136 West 31st st., New York City.
178	Arlington P. Fulton	Individual	Ferndale, N. Y.
179	Boonville Creamery & Cold Storage Company	Corporation	Boonville, N. Y.
180	Wilna Farms Co	Corporation	Carthage, N. Y.
181	Halcott Centre Creamery Co	Corporation	84 Delaware st., Walton, N. Y.
182	Charles Mertz	Individual	60 Stanhope st., Brooklyn, N. Y.
183	Harlem Dairy Products Co., Inc	Corporation	Clinton, N. Y.
184	Frank Cuomo	Individual	Bloomingburg, N. Y.
185	Zellner Brothers, Inc	Corporation	37 Montrose ave., Brooklyn, N. Y.
186	M. Burgmann, Inc	Corporation	156 West 31st st., New York City.
187	Frank F. Hatch	Individual	105 West 46th st., New York City.
188	Gilboa Creamery Co	Corporation	105 First st., New York City.
189	B. K. Brown & Son Co	Corporation	Remsen, N. Y.

MILK DEALERS LICENSED UNDER SECTION 55 OF AGRICULTURAL LAW, FOR THE YEAR ENDING SEPTEMBER 1, 1915 — *Cont'd*

License No.	NAME	Organization	Address
190	Fulboam Dairy Co	Corporation	Skinners Falls, N. Y. (P. O. Milanville Pa.)
191	Norwich Dairy Co	Partnership	63 Henry st., Norwich, N. Y.
192	Fenton F. Craft	Individual	37 Liberty st., New York City.
193	Georgina G. Martin, trading as Martin's Tioga Dairy	Individual	572 Greenwich st., New York City.
194	Johnston & Albee	Partnership	204 West 96th st., New York City.
195	Mundale Creamery Co	Corporation	Walton, N. Y.
196	Julia L. Goss	Individual	7 North Delaware st., Glens Falls, N. Y.
197	The Brooklyn Milk Co., Inc	Corporation	262 Bond st., Brooklyn, N. Y.
198	The Keystone Dairy Co	Corporation	Preble, N. Y.
199	Bohner & Seubert	Partnership	821 Genesee st., Buffalo, N. Y.
200	Howell Condensed Milk & Cream Co	Corporation	1 Jefferson Market, New York City.
201	Datus Clark	Individual	Peru, N. Y.
202	Samuel Kappler	Individual	Lee Center, N. Y.
203	Gold Seal Dairy Co	Corporation	Canajoharie, N. Y.
204	Model Dairy Co., Inc	Corporation	246 Eighth ave., New York City.
205	Charles Rose & Son	Partnership	Cobleskill, N. Y.
206	Benjamin H. Marks trading as Amity Dairy	Individual	105 West 46th st., New York City.
207	Locust Farms Co	Corporation	458 Tenth ave., New York City.
208	Fred N. Bunger	Individual	South Columbia, N. Y.
209	James E. McElroy	Individual	320 East 28th st., New York City.
210	Isaak Lieber	Individual	5 East 107th st., New York City
211	Frank B. Allen trading as Springfield Creamery	Individual	S. Berlin, N. Y.
212	Diamond Dairy Co	Corporation	Carlton ave. and Pacific st., Brooklyn, N. Y.
213	John Wesley Thorn	Individual	Westtown, N. Y.
214	Beakes Dairy Co	Corporation	206 East 12th st., New York City.
215	Henry A. Bullard	Individual	Winthrop, N. Y.
216	Cincinnatus Dairy Co	Corporation	Cincinnatus, N. Y.
217	Glens Falls Dairy Co	Corporation	192 Ridge st., Glens Falls, N. Y.
218	Ballston Spa Creamery Co	Corporation	270 Milton ave., Ballston Spa N. Y.
219	Osmond L. Kimball trading as Argyle Creamery	Individual	Argyle, N. Y.
220	William F. Karlen	Individual	Boonville, N. Y.
221	Maple City Dairy Co., Inc	Corporation	River Front, Ogdensburg, N. Y.
222	Bainbridge Milk Co	Corporation	Bainbridge, N. Y.
223	Max Smith	Individual	1 Gouverneur st., New York City.
224	Jefferson Butter & Cheese Co	Partnership	Jefferson, N. Y.
225	Laemmle Dairy Co., Inc	Corporation	202 Bleecker st., New York City
226	Fred E. Benway	Individual	85 Elm st., Hudson Falls, N. Y.
227	Charles H. Van Hyning	Individual	1 Lincoln st., Glens Falls, N. Y.
228	John F. White Co	Corporation	Mount Morris, N. Y.
229	I. J. Chapman & Son	Partnership	565½ S. Clinton st., Syracuse, N. Y.
230	Jacob Smith	Individual	590 Water st., New York City.
231	The Dry Milk Co	Corporation	11 Pine st., New York City.
232	American Milk Co	Corporation	Adams Center, N. Y.

MILK DEALERS LICENSED UNDER SECTION 55 OF AGRICULTURAL LAW, FOR THE YEAR ENDING SEPTEMBER 1, 1915 — *Concl'd*

License No.	NAME	Organization	Address
233	H. & T. Michaelsen	Partnership	408 West 127th st., New York City.
234	Adams & Shearing Dairy Co	Corporation	Marilla, N. Y.
235	Gage E. Tarbell trading as Tarbell Farms	Individual	Smithville Flats, N. Y.
236	Frederick Kranbuhl	Individual	Constableville, N. Y.
237	Merrell-Soule Co	Corporation	Syracuse, N. Y.
238	Dora Fayen	Individual	1026 Faile st., New York City.
239	Estella Lawson Geier, trading as Green Lake Dairy	Individual	453 West 38th st., New York City,
240	Cohen Dairy Co., Inc	Corporation	60 Lenox ave., New York City.
241	Max Blum	Individual	142 Reade st., New York City.
242	Herbert Wadsworth	Individual	Avon, N. Y.
243	Hoefler Ice Cream Co	Corporation	294 Connecticut st., Buffalo, N. Y.
244	Rich's Jersey Creamery Co	Corporation	Cattaraugus, N. Y.
245	Joffey & Perlman	Partnership	14 East 114th st., New York City.
246	Walker Ice Cream Co	Corporation	Kiantone, N. Y. (P. O. Jamestown, N. Y.)
247	Borch's Dairy Co., Inc	Corporation	8-12 Forest ave., Brooklyn, N. Y.
248	G. Savarese & Son	Partnership	East Chatham, N. Y.
249	Webster E. Griffith	Individual	Madrid, N. Y.
250	Cole & Fish Star Creamery Co	Corporation	158 Chester st., Buffalo, N. Y.
251	Normanskill Farm Dairy Co	Corporation	126 Jay st., Albany, N. Y.
252	Hudson Valley Dairy Co	Corporation	Newburgh, N. Y.

Paul Work

UNIV. OF MICH.

STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

CHARLES S. WILSON, Commissioner

Bulletin 70

The Vegetable Industry in New York State

> "*It is not simply beets and potatoes and corn and string beans that one raises in his well-hoed garden; it is the average of human life.*"
> CHARLES DUDLEY WARNER

Issued by the Bureau of Farmers' Institutes and Compiled under the
Supervision of the Director

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INTRODUCTION

Since the long ago when "the Lord God planted a garden eastward" and set man "to dress and to keep it" that he might live from the fruits thereof, gardens large and small have occupied an important place in man's affairs, even though, falling into a more savage state, he became more or less a carniverous animal. For the most part he has remained such until the present, when in our most civilized countries the scarcity and high price of meat is of necessity turning mankind back to a better diet, made up more largely of "the fruits of the ground" rather than the flesh of "beasts of the field."

Few realize how great is this industry among the many in our state's agriculture, vegetables exceeding in value both the wheat and the corn crop. With these facts in mind it is readily apparent that the subject of vegetable growing should loom large; and in the series of bulletins which the Bureau of Farmers' Institutes in the New York State Department of Agriculture is publishing, should occupy an early and conspicuous place.

Two thoughts have been uppermost: first, that it may contain specific directions which will be of material help to all classes in meeting the varied problems with which the gardener has to contend; second, that it shall set forth to our own people and to the many from outside our borders — whose minds are turning hither as a possible dwelling place — the magnitude and variety of the business, as well as the many sections particularly well adapted by nature to one or more lines of vegetable growing, within easy reach of some of the world's best markets.

To accomplish this purpose the compiler has enlisted the services of scientists from our Stations to advise as to soils, fertilizers, diseases and insect pests; also specialists in growing or handling various vegetables — from the seed to the market and table — both from our own state and beyond, in order that it might be cosmopolitan and not warped by local prejudice or sectional limitations. The fundamentals treated are applicable everywhere.

To all who have so freely contributed of their best, the compiler would record his obligation and appreciation; particularly to those personal friends from whom he has exacted and received tribute, chief among whom are Mr. Paul Work and Mr. A. E. Wilkinson, of Cornell University, without whose advice and assistance this bulletin could not have been issued.

Those interested in the subject are made up of all sorts and conditions of men, including not only the child with the strip of ground so dear to his heart, which has first brought him in touch with Nature's wonderful mysteries of the development of the seed into the living plant, and which has engendered a love for the soil never forgotten; the urban dweller with his circumscribed garden plot, whose hours of sunshine are as few as those in the canyons of the mountains, and the farmer with his more ample space — sometimes, alas, like "the field of the slothful and the vineyard of the man void of understanding," yet when properly managed a most potent factor in his farm economy — but also the one who specializes in vegetable growing on a large scale. To all of these whom this volume reaches with the springtime goes the wish on the part of the compiler, that it may be not only productive of seed sowing, but also assist in a more abundant harvest.

MARKET GARDENING IN NEW YORK STATE

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In order to thoroughly understand what is meant by market gardening, it will be best to define it: "Market gardening is the intensive growing of vegetables, generally on limited areas and very near market." It may be seen from this definition that one naturally expects to find market gardeners located around all our large cities, and this is true. There are, however, one or two exceptions to this rule, where one may find market gardeners situated a considerable distance from their markets. A noted exception is the Hallock Farm at Orient, N. Y., where thirty-four acres are under the Skinner irrigation system, all being devoted to intensive vegetable production.

Near New York City, on Long Island, are found a great many market gardeners. The soil there is particularly adapted to the growing of vegetables under intensive systems. Most of the men there are Germans, Poles, Belgians, or from other European countries. Very few greenhouses are used; most of the forcing work is accomplished by using hotbeds and cold frames. It is possible to find men who have 3,500 to 4,000 sash on their small farms. The writer is acquainted with a market gardener who has a twenty-acre farm, three acres of which is covered with thirty-five hundred sash, the remainder of the land being under the overhead system of irrigation. Other men with only five acres have from 1,500 to 2,500 sash.

All of the product raised by these men is marketed in Brooklyn or New York City, being carried there on wagons and sold from them at an early hour in the morning. The selling takes place in a public market, two of the largest being Wallabout in Brooklyn and Harlem in New York.

Through Westchester county are also many market gardens supplying vegetables to the New York market. Newburgh on the Hudson has a group of market gardeners who are very well organized and are catering strictly to the needs of their local market. At Poughkeepsie is found another group of market gardeners who both cater to local market and do a considerable shipping business. There are a few market gardeners at Kingston, Catskill, and Hudson, all catering to the local need. Around the capitol district, that is, Albany, Troy, and Schenectady, there are many market gardeners. However, no place in that section is as well known as Watervliet. Here may be found farm after farm devoted to the growing of vegetables for the markets in these three large cities. Near Oswego, Watertown, Amsterdam, Utica, Rome, and Herkimer a few market gardeners supply the needs of the local market and in some cases have a surplus which is sent elsewhere.

FIG. 340. A ROW OF COMMISSION MERCHANTS NEAR HARLEM MARKET, NEW YORK CITY

It is possible to find market gardeners about Syracuse no matter in what direction one travels. The tendency among these is to practice some of the more modern ideas. They are slowly getting away from hotbeds and cold frames and working into greenhouses. Most of them have extra choice sandy loam in which to grow their crops. Practically all of the men drive to market, selling their goods in the large public square.

At Irondequoit, Monroe county, is located the largest greenhouse vegetable forcing community in New York State, there being over a hundred growers, each of whom has one or more glass houses. Practically all of these growers look on hotbeds and cold frames as forcing structures not to be considered in their scheme of farming. The Irondequoit growers should be called the New York State advance guard in the most up-to-date lines of forcing vegetables. They raise radishes and lettuce in the fall, sometimes also cucumbers or tomatoes, and cucumbers are often grown in the spring. They also grow a great variety of vegetables on the land outside the forcing structures. Their product is sold locally on the public market from their wagons or to special customers such as hotels, restaurants, and stores. When a surplus is found, it is shipped away to other markets.

Near Buffalo there are a great many market gardeners located at Gardenville, Hamburg, Eden, Sanborn, Lancaster, Jewettville, South Wales, and other towns. Many of these are using the hotbeds and cold frames, and a few have the more modern greenhouse structure. All are intensive growers of vegetables outside as well as inside the forcing structures. The product is carried by wagon to the Elk Street or to the Polish market and is there sold. Some of the vegetables are shipped away either through a local association or through the hands of commission men.

At Elmira, Ithaca, Cortland, Auburn, Binghamton, Port Jervis, and Middletown are found market gardeners, several being located near each of these cities to supply the local demands. In some cases up-to-date greenhouses are used, supplemented with hotbeds and cold frames, and outside gardening is practiced as well.

INTENSIVE CULTURE

The intensity of the operations conducted by the men near the different cities is quite apparent when one understands that from their land they are able in a single season to remove from one to three crops. In some cases, particularly on Long Island, even four crops are removed in some years. It is necessary for these men to reap many crops each year because of the high valuation of the land. Near New York City an acre of land is worth almost any price — $5,000. to $7,500 or even more — while in other places it seldom fall lower than $250, and in many places averages $1,000 per acre.

Another reason is found in the marketing conditions. Companion and succession cropping are commonly practiced, a crop such as beets or carrots occupying the land early in the spring, followed by a crop of celery later. Between the celery two rows of lettuce may be sown, making three crops from the same land the same year. Again, peas may be grown early, followed by beets or carrots. Sometimes lettuce or onions are grown between a crop of tomatoes when the tomatoes are young. The men take every advantage of the space and the season, working, if possible, to obtain the maximum yield and the maximum number of crops from every piece of land. It is then quite evident to some people that a man with a five-acre farm is really cultivating a farm of fifteen or twenty acres where he uses succession crops. A wide diversity of crops is raised and not one specialty, because the men have markets to supply that demand a great variety of vegetables. Also, if the grower wishes to hold his trade, he should be on the market nearly every day, often selling some particular crop at a very small profit rather than losing trade. In order to carry out this plan, it is absolutely necessary to grow many different crops and at different seasons.

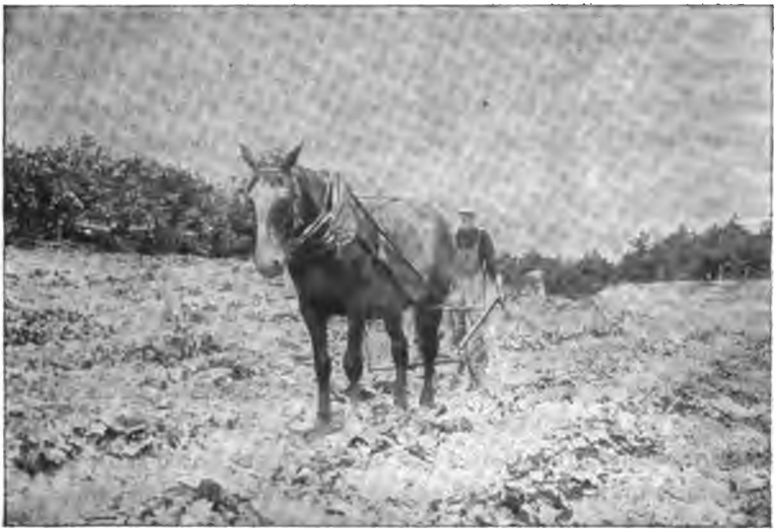

FIG. 341. CONSERVING MOISTURE BY THOROUGH TILLAGE

STABLE MANURE AND TILLAGE

All of the market gardeners use large quantities of manure. Very few of them understand the use of commercial fertilizer. Often forty to sixty tons of manure are applied to each acre each year. The result from this liberal manuring is that the soil has a very fine texture. Crops grow very rapidly, of large size, and are, therefore, very desirable. Most of the market gardeners practice deep preparation of the soil, following with thorough fining and smoothing, the preparation of the soil being of the utmost importance with these men. After the plowing and fitting many gardeners do not utilize the horse at all in their work, preferring to use the man-power wheeled planters and cultivators. By this method the crops are planted very close together, resulting in obtaining a larger yield from each acre. Much more hand labor is used than in any other line of farming. Often ten to fifteen workers are found at times on a five-acre garden, and on the larger gardens, such as a twenty or twenty-five acre farm, from three to five laborers per acre are often utilized profitably.

HOME-GROWN SEED

In some places, particularly among the market gardeners of Long Island, a certain amount of seed is raised. Thus, to a certain extent, these gardeners are independent of the seed houses, especially for particular vegetables. It would be indeed difficult to duplicate the celery raised by these Long Island men from seed produced by them, and this could also be said of the lettuce which they grow from their own seed in the hotbeds and cold frames.

IRRIGATION AND MARKETING

Slowly these market gardeners are realizing the importance of controlling one more factor — that is, water — and thus preventing drought. On Long Island there are several men who have ten acres or more under irrigation. In other parts of New York State irrigation systems are being installed and successfully used, particularly at Irondequoit and Syracuse. Practically all of the material raised on these market gardening farms is carried to the cities on the teams or auto trucks owned by the market gardeners. Most of the teams have a certain place in the markets

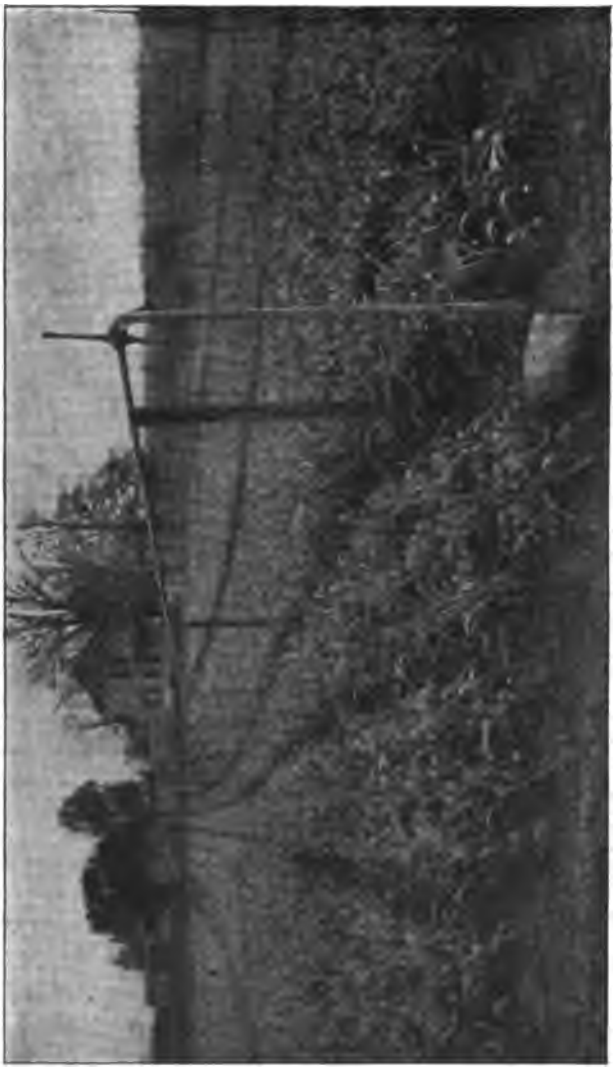

FIG. 342. OVERHEAD IRRIGATION USED FOR LEEKS DURING THE GREAT DROUGHT, OCTOBER, 1914, FLUSHING, L. I.

and are found at these stands each morning during the week. Besides placing their teams on the markets, many of the growers have private trade — hotels, restaurants, stores, and the like. Here they deliver their high-class product early in the morning. Some of the best growers send to the city from three to five loads or more each day during the summer, a certain number attending the market and others looking after the local demands. It is an interesting scene as well as an educational opportunity to visit and study any one of the large city markets, such as the Wallabout or Harlem market in New York City or the public markets at Troy, Syracuse, Rochester, or Buffalo. Many of the smaller cities are establishing public marketing places, much to the advantages of the producer and the consumer.

VEGETABLE GROWING ON LONG ISLAND

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There are three distinct phases of commercial vegetable growing developed to a high degree on Long Island, namely:

1. Market gardening, which is highly developed on the western end of the island within driving distance of the large wholesale and retail markets of New York City.
2. The growing of vegetables for the canning and pickling industry throughout the central part of the island.
3. Truck gardening in the eastern part of the island, which is more remote from the large markets.

MARKET GARDENING

Market gardening is the chief agricultural occupation on the western end of Long Island. Land as a rule is very high priced — in many cases it is worth several thousand dollars an acre and in some cases even more; therefore, the methods practiced are very

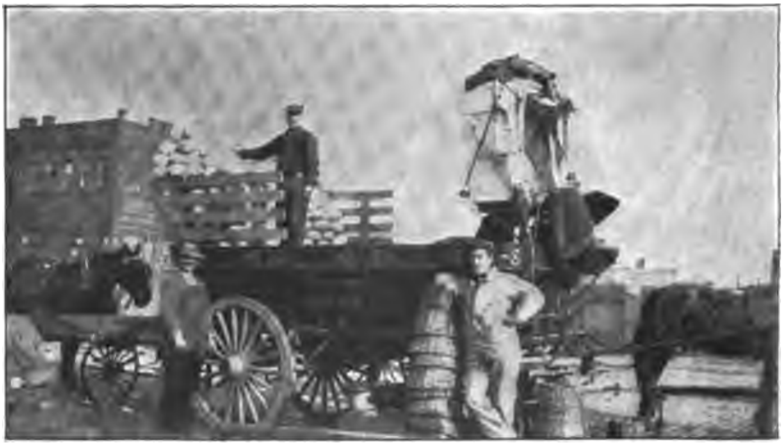

Fig. 343. Typical Long Island Market Wagon in Harlem Wholesale Market

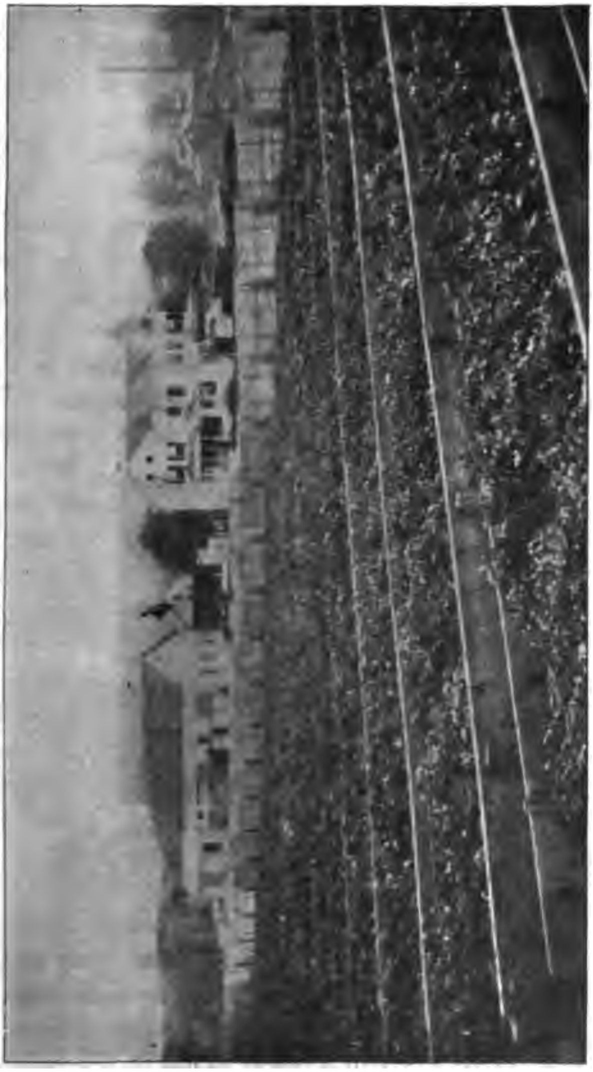

FIG. 344. MATURE CARROTS IN COLD FRAMES, TO BE PROTECTED AND BUNCHED DURING DECEMBER AND JANUARY, FLUSHING, L. I.

intensive. A great deal of hand work is resorted to in cultivating. Companion and succession cropping are developed to a high degree. Large areas of glass are used in the form of cold frames in order that a continuous supply and a large assortment of vegetables can be marketed during as many months of the year as possible. There are very few forcing houses in the form of greenhouses, since much of the land is rented and therefore no permanent improvements are made. A great proportion of the gardeners are foreigners — Poles, Italians and Germans. The marketing is usually done personally, by attending the large wholesale and retail markets of New York City. The style of the Long Island market wagon is peculiar to this section and parts of New Jersey adjacent to New York. The load of vegetables is usually sold wholesale, sometimes by the load and sometimes by the barrel, bushel or crate. The grower likes to sell his vegetables as soon as possible and return home in order that a day's work can be done. The cold frames are used as early in the spring as weather conditions permit. Sometimes the seed bed is prepared in the fall and left until January or February when seed can be sown. The first early cold frame crops consist mostly of salad plants, such as lettuce, endive and parsley, and such crops as radishes, early beets, carrots, etc. The crops grown in the open ground include vegetables that can be grown commercially in this latitude; the assortment is very large. Cold frames are also brought to use in the fall and winter by growing such vegetables as beets, parsley, carrots and parsnips in the frames during the fall, and covering them over with glass during severe weather. In this way these crops can be bunched during December and January.

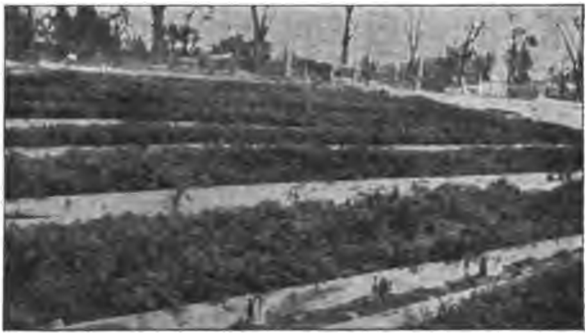

FIG. 345. CARROTS MATURED IN COLD FRAMES IN THE FALL, TO BE PROTECTED WITH GLASS AND BUNCHED DURING THE WINTER, ELMHURST, L. I.

Sound
FISHERS ISLAND
BLOCK ISLAND
BLOCK ISLAND R.I.
Montauk Pt.
MONTAUK
N
Hudson
River
NEW YORK BAY
FLATBUSH AV.
BROOKLYN
KINGS
Parkville
St. George
BAY RIDGE
Bath Jc.
Ft. Wadsworth
Ft. Hamilton
Ft. Tompkins
STATEN ISLAND
Sea Gate
CONEY ISLAND
Brighton
MANHATTAN BEACH
ROCKAWAY BEACH
Woodside
Glendale Jc.
Ocean Av.
Man. Beach

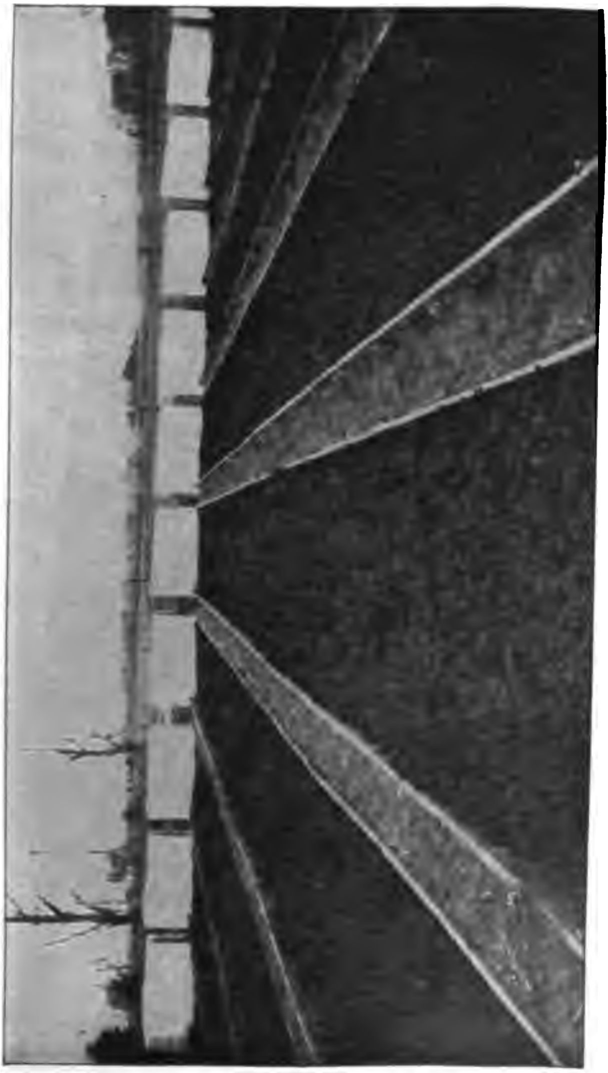

FIG. 346. PARSLEY IN COLD FRAMES IN AUTUMN, TO BE PROTECTED AND SOLD DURING THE WINTER, FLUSHING, L. I.

The market gardening section is represented on the map by (1) or that part of the Island west of Hicksville. There are also small market gardening sections in other parts of the Island to supply local towns and summer resorts, but the main section is confined to the area mentioned.

Large quantities of manure are used by these gardeners. A carload, or from 20 to 40 tons per acre, is not an exceptional application. This puts the soil (which is usually quite sandy) in ideal physical condition for working and holding fertility and moisture. The moisture factor is a very important one and some growers who own their small farms have installed and are installing the overhead system of irrigation.

The auto truck is taking an important place in marketing the produce. Larger loads and very much less time is spent on the way by the use of truck.

VEGETABLES FOR THE CANNING AND PICKLING INDUSTRY

That part of the Island designated on the map by figure (2) is the section is which is raised large quantities of cucumbers and tomatoes for pickling, and cabbage for kraut. These crops are raised on an extensive scale and very often in connection with general farming.

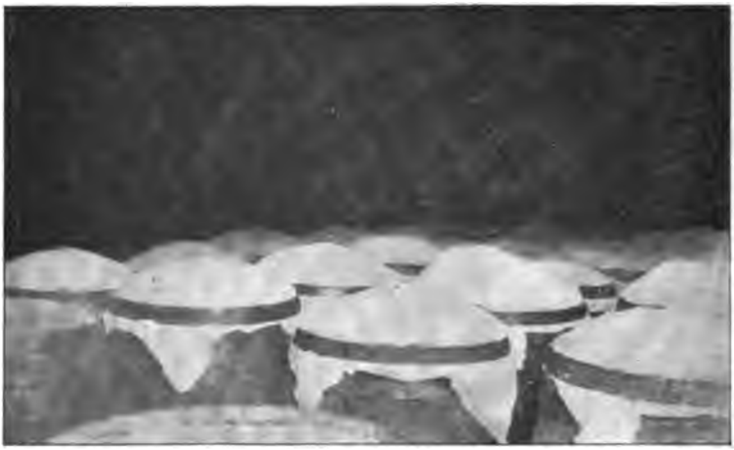

FIG. 347. BARRELS OF KRAUT IN A BOX CAR READY FOR SHIPMENT, HUNTINGTON, L. I.

In the case of cucumbers, especially, the soil is given careful attention in its preparation. Manure is the chief fertilizer used as the water retaining capacity of the soil is very important for this crop. Large quantities of commercial fertilizer are not desirable from the canners' standpoint as the cucumbers grown under these conditions do not hold up as well after they are salted.

Dill pickles are the chief product of the pickling factories. The crop comes on about the first or second week in August and continues as long as the growers can fight the blight by thorough and frequent sprayings with bordeaux mixture. The pickles are sold to the canneries by the thousand, and from fifty to eighty thousand is a good yield per acre. The average price paid is about $2.50 to $2.75 per thousand.

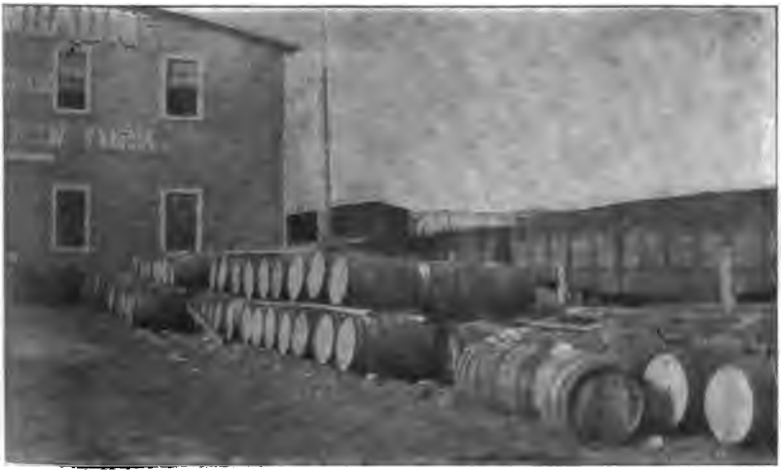

FIG. 348. BARRELS OF TOMATOES IN A BRINE SOLUTION. ALSO SHOWS CAR-LOAD OF MANURE AND PART OF CANNING FACTORY

When the pickles are brought to the factory they are put into wine barrels into which has been placed some dill and about a quart of mixed spices; dill is also placed at the top of the barrels, after which they are securely headed and filled through the bung with a brine solution. The pickles are then allowed to ferment for several months.

The tomatoes, which follow cucumbers very closely, are also placed in a brine solution.

Cabbage for kraut is trimmed, cored and shredded into large, wooden tanks holding about 20 tons. Fine salt is scattered between the layers of shredded cabbage. It is allowed to remain this way for ten days or two weeks, after which it may be put into barrels and shipped to market by the carload, while the tanks are refilled. Cauliflower is also pickled to some extent. Long Island dill pickles and sauerkraut have a wide reputation for their quality.

TRUCK GARDENING

Truck gardening is carried on very extensively in the eastern part of Long Island in connection with general farming. This section is represented on the map by figures (4) and (5) and roughly comprises that part of the Island east of Manorville and Calverton.

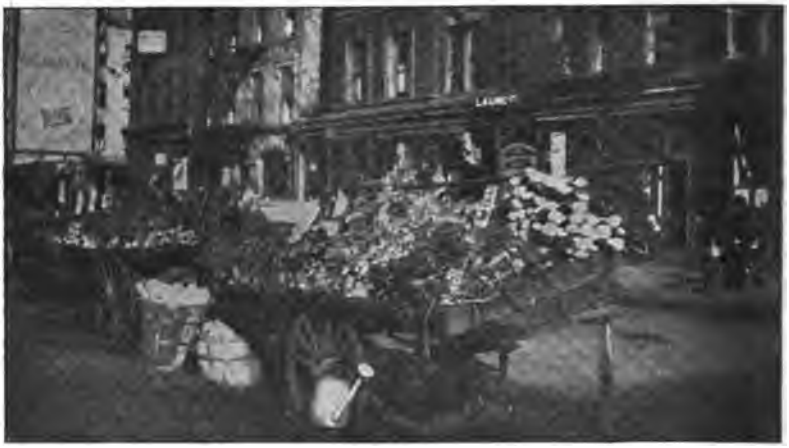

FIG. 349. RETAILERS' PUSH CARTS ON THE STREETS OF NEW YORK

On the Northern Peninsula (4) the chief truck crops grown are cauliflower, potatoes, (early and late) brussels sprouts and lima beans. The cauliflower industry is very highly developed and enjoys a wide reputation for high quality. Practically every farmer in this territory grows as much cauliflower as he can well handle. The crop is sold almost altogether through the Long Island Cauliflower Association which is in a very thriving condition and takes a great deal of responsibility along the lines of marketing from the growers. As these growers are remote from the markets and cannot market their products personally, representatives of the association handle the produce in the city. The association also sells cauliflower in carload lots to other large markets such as New Orleans, St. Louis and Chicago.

On the eastern end of the island early potatoes dug in August are an important crop and good prices are usually realized. Farther west the late crop is the important one. It has been estimated that this year, which was a very good year for potatoes on Long Island, the crop approached 3,000,000 bushels. These have been largely sold in the past through the Long Island Potato Exchange, although great quantities are also sold through other sources. Lima beans are growing in popularity and the acreage is increasing; it is one of the newer crops in this section. They are sold green by the bushel. Brussels sprouts are also grown extensively and sold during the fall and winter.

On the southern peninsula (5) cauliflower and brussels sprouts are not grown commercially, due to unfavorable climatic and soil conditions. Potatoes and lima beans are the chief vegetable crops. Due to the scarcity and high price of manure in the eastern part of the Island, cover crops are grown to a great extent, mostly rye; large quantities of commercial fertilizers are used, very often as high as one ton per acre for cauliflower and potatoes. The produce is practically all carried by railroad to New York City. During the cauliflower season a special train is run each day collecting cars of cauliflower from Southold to Manorville and thence direct to New York. There is a small trade across the sound to New London and Bridgeport, Connecticut.

That section of the map indicated by figure (3) is undeveloped; much of it is in a wild state, overgrown with pines, scrub oak and small sprouts. However, there are numerous cleared spots or farms. Throughout the central part of the Island, around Middle Island, Yaphank, Manorville, Selden and Holtzville, fruit growing is very popular, especially peaches. There are several orchards containing over 100 acres. Shelter Island is also an apple producing section and some vegetables are grown there.

The north and south shores are very rapidly becoming more and more popular as summer resorts and draw thousands of people each season. For this reason there is quite a local demand for fresh vegetables and a number of growers are taking advantage of the opportunity.

TRUCK GARDENING ON THE UPLANDS OF WESTERN NEW YORK

W. E. Evans, Alden, N. Y.

ADVANTAGES OF SECTIONS ABOUT BUFFALO AND CHARACTER OF THE FARMS

A light, sandy loam; an excellent market for vegetables in Buffalo; a cheap source of stable manure in the same city and good roads leading to it, make Western New York particularly adapted to vegetable growing.

By far the largest part of the vegetables used in Buffalo is raised on small farms located just beyond the city limits. The land originally belonged to a religious sect known as "Ebenezers," who, when they moved to Iowa, divided their farm land into lots about thirty acres in size. As a result the farms in this section are all of this size or a multiple thereof, fifteen being a common acreage. The average amount of land devoted to the raising of vegetables is ten. the remainder being devoted to growing feed for the farm animals.

The worth of this land is determined by the possibility of cutting it into city lots rather than by its fertility. Few of the farms which are for sale can be bought for less than $500 per acre. Railroads paid $1,000 per acre for land they bought, and after it is cut up into city lots it is worth $1,200 per acre.

TYPE OF SOIL AND CLIMATIC CONDITIONS

No one particular soil type is common in this section although the light, sandy loams predominate. Some are creek bottom land and have excellent drainage in the form of a gravel subsoil, while others have a hardpan subsoil. A few are heavy clays.

In this narrow strip surrounding Buffalo the seasons are about two weeks later than in the more inland section, due to the influence of the cold winds from Lake Erie. The prevailing winds come from the west and bring abundant snows and rainfall during the late winter and early spring, but the summers are often dry.

NEED AND METHOD OF DRAINAGE

The drainage for the most part is naturally poor and nearly every farm has more or less tile drain. About 1,500 feet of tile to the acre is required. It is placed on an average of three and one-half feet below the surface, although I know of one instance where a tile was laid fifteen feet in order to get through a knoll and drain a hollow spot. Glazed tile, seldom over four inches in diameter, are used. They are given a fall of not less than one inch to a hundred feet and are interspersed with numerous silt basins. Experience has proven that tile laid more than ten or twelve feet apart, if three and one-half feet deep, are not effective quickly enough to save the delicate root systems of the leafy vegetables.

In many instances it was necessary for several farmers to cooperate and join main tile to secure outlets for the water. In a few cases part of the farm has a gravelly subsoil and part a hardpan. In such farms the clays are drained by leading a tile to the gravel and allowing the water to drain away in that manner. In a few cases quicksand was encountered. Here a concrete bottom was made before laying the tile.

About 85 per cent. of the farmers have tiled to some extent, while 30 per cent. have a complete system of tile drainage. The natural system rather than the gridiron system has been adopted.

MANURE AND METHODS OF HANDLING

These farmers secure their manure from the Buffalo stables drawing two or even three loads each week. Sometimes two farmers cooperatively contract to keep a stable clean by drawing a load each day. Enormous quantities of manure are used and sometimes it seems impossible to plow it under. The manure is made from shavings instead of straw bedding and in the case of the breweries it contains many hops. Both of these tend to sour the soil.

Nearly every farmer has learned the value of lime, and by cooperating they buy in carload lots. They use quicklime entirely and either air or water slake it themselves. Again they cooperated and bought a community lime drill which spreads the fine powder without any danger to man or beast, and, besides distributing it evenly, the desired quantity can be applied by regulating the flow.

The truck farmers of Western New York are giving no little attention to the care of the manure. Drawing, as they do, such large quantities in the winter months when they cannot operate their spreaders, it is necessary to make great piles about three feet deep and often a hundred feet long. To this they add rock phosphate or acid phosphate at the rate of fifty pounds to the ton. This pile is turned twice and sometimes three times before it is spread on the fields. Some of this manure is used for top dressing to conserve moisture, much is used in hot bed construction and the remainder is plowed under.

In addition to this, nitrate of soda, sulphate of ammonia and sheep manure are purchased. These are used for forcing such crops as lettuce, spinach, etc., or to promote rapid growth to overcome blights or rusts.

GROWING SEEDLINGS

Each farmer reserves more or less space for cold frames and hotbeds. These are used chiefly for growing seedlings for transplanting, but a few farmers raise hotbed lettuce for the market.

Many farmers find profit in raising seedlings of both vegetables and flowers. These are sold to the Buffalo people who used them in their back yards. Cabbage and tomato seedlings are especially popular.

MARKETING

The farmers take a load of crated vegetables to market and bring back a load of " empties." They sell by wholesale only to commission merchants, wholesalers or hucksters, and by telephone can keep in touch with the buyers at all times. Usually the whole load is ordered goods so that all that is necessary is to deliver it and take orders for the next day. The growers take great pride in grading their goods and selling A1 vegetables in boxes marked as such.

The marketing facilities of this section are ideal. A farmer can go to the Buffalo markets, deliver his goods, take his orders for the next day and get home before noon. Nearly all the roads leading to Buffalo are brick paved and afford excellent traveling facilities for these men.

LABORERS

Laborers are abundant. Hundreds of Polish women walk from Buffalo to these farms and work for from $1 to $1.10 a day. They furnish their own lunch at noon, and are usually supplied with something to drink by the farmer. They are as a rule very skilled weeders, bunchers and washers, and tie up a surprisingly large amount of celery in a ten-hour day.

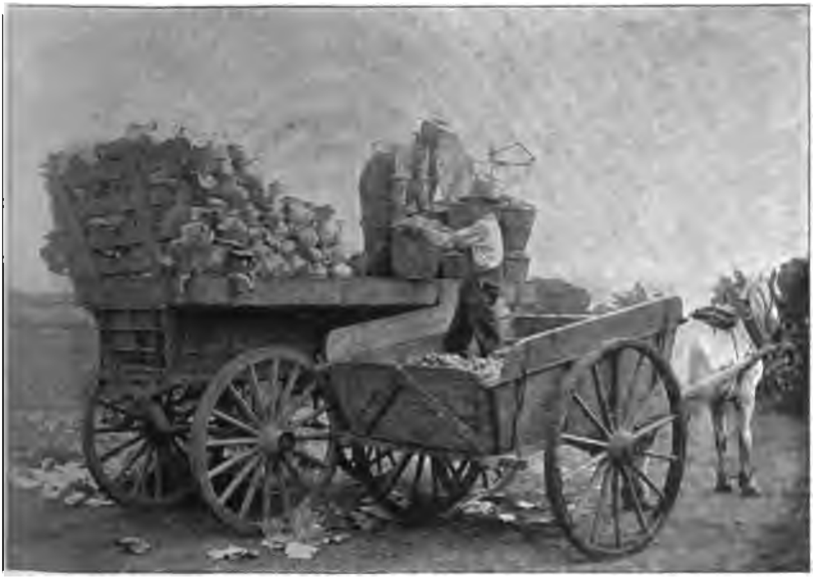

FIG. 350. GETTING READY FOR MARKET

Men do all the team work — plowing, harrowing, marketing — while the women do the trimming, bunching, washing and packing.

Several farmers have washing machines which are very effective and economical. In a general way they consist of two cylinders over which is stretched a continuous carrier. As the carrier moves along the vegetables are placed on it and as they pass from one end to the other, water under pressure is forced on them from above and below through the Skinner nozzles. This washes off all dirt

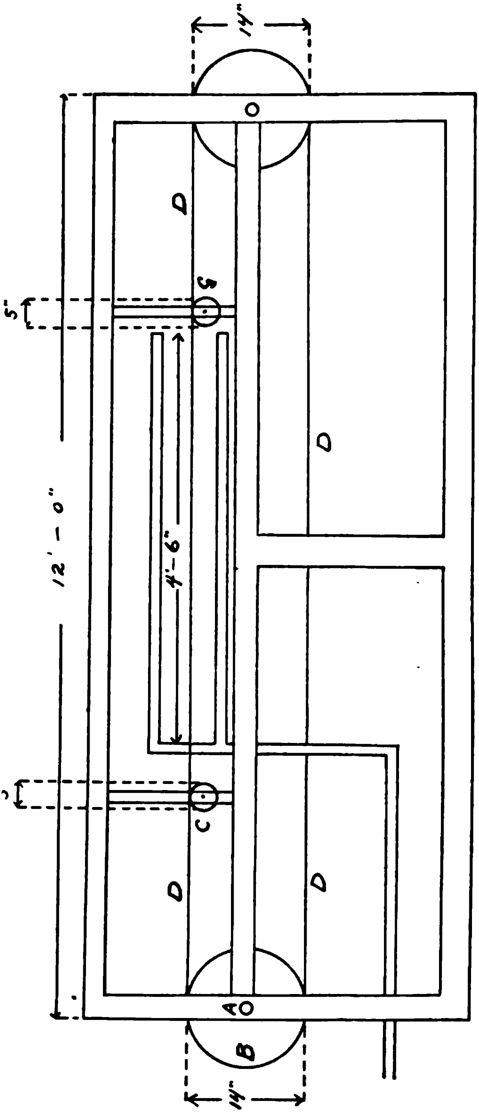

FIG. 351. VEGETABLE WASHING MACHINE (NOT FOR LARGE ROOTS)

A.— One-inch pipe with crank
B.— Cylinder (3 feet long, 14 inches in diameter). Lath used for staves
C.— Rollers to support Carrier "D."

and does not bruise or break off any of the foliage. The machine is turned by hand and as fast as two can feed it two empty the other end and pack the goods in orange crates.

In order to provide work for their help during the winter months, farmers often build greenhouses. With but one exception, however, these are used for flowers instead of vegetables. In this one case the man raises cucumbers. Among the flowers raised are carnations, roses, chrysanthemums, geraniums, asters and ferns.

This system keeps one team on the road all the time hauling manure, coal or produce.

CROPS GROWN

The first crop sown and harvested is the Scarlet Globe radish. Early in the season the Buffalo market demands large green tops but later in the season smaller tops are preferred. Lettuce is sown about the same time but matures a little later. The radishes are tied into bunches and sold by the dozen bunches. Lettuce is packed in orange crates, usually two dozen to a crate, and is sold by the crate.

Although Western New York is famous for the growing of late cabbage, nevertheless this section in order to feed Buffalo must raise a little of everything. Next to cabbage the most extensively raised crops are: lettuce, beets, tomatoes, celery, radishes and cauliflower. Occasionally one will find a farmer who makes a practice of supplying a certain kind of crop to a particular firm. One farmer makes a specialty of parsley for hotels and dining cars, another has an extensive trade in oyster plants, while another has made a specialty of small white onions for pickling.

ADVANTAGES OF HOME-GROWN PRODUCTS

The products of this vicinity do not compete in the Buffalo market with greenhouse or southern-grown vegetables. The people of Buffalo have been educated to demand home-grown goods. This demand has been created by producing a quality of goods which are better flavored than shipped goods. Even muck raised vegetables stand little show beside these upland vegetables. As soon as the home-grown goods come on the market the shipped vegetables are pushed aside. Many of the grocerymen advertise home-grown vegetables as a specialty.

The seed from which these men raise their crops is largely purchased from the various agents who scour the country. The farmers have learned that the seed companies specialize in their products and they therefore buy these specialties rather than give all their orders to one company. On the other hand, a few farmers raise their own seed. Much of the onion seed is home grown. In fact, "Ebenezer onion" is famous over the state and commands a high price as seed or sets. One or two farmers have been raising their own cabbage seed but they never sell any. One strain of cabbage seed is about twenty years old and apparently as good as ever.

INCOME AND EXPENSE

The income from these farms varies with the seasons and the conditions of the markets. The farmers usually figure on three crops — one to pay interest, insurance and taxes; one to pay the help, and the third for profit. If any one crop fails or is a partial failure it immediately spoils that farmer's chances of maka profit. No figures on net profit are available but gross receipts for a farm of ten acres ranges from $5,000 to $20,000 a year. Of course a very large percentage of this is spent for help, since vegetable gardening always requires much care in tilling, weeding, manuring and getting it ready for the market. Very few of these farmers keep cows, pigs or hens so that the products from these animals must be purchased.

MORE DISTANT SECTIONS

The second area of upland truck raising farms lies about fifteen or twenty miles outside of Buffalo. It is difficult to draw crops to Buffalo from these sections so most of the goods are shipped. In the first area every farmer is a gardener with a greenhouse or two on the side, while in the second section many are general farmers raising some vegetables as a side line. There are few real truck raisers who raise vegetables exclusively. Large areas of cabbage, cauliflower and tomatoes are shipped to various points. In this section they have no hold on the Buffalo market such as the others more favorably situated. They have formed associations which hire managers to look after the shipping and grading of the goods. These farmers also raise much hay and enormous quantities of potatoes. They keep a cow or two, raise hogs for home consumption and have a small flock of hens, usually of mongrel breeds. Nevertheless both classes of farmers are prosperous, each liking their own method of farming better than the other.

2

MUCK SOILS IN NEW YORK: THEIR NATURE AND DISTRIBUTION

ELMER O. FIPPIN

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Muck soil is made of the partially decayed remains of plants that have accumulated in swampy places. The swampy condition is responsible for their occurrence. Muck soils should be differentiated from those swampy soils that are rich in organic matter but not sufficiently rich so that they are combustible. There is a wide range in the character of such material. The plant substances of which it is composed may be only slightly decayed, in which case the material is fibrous and shows the plant tissues. Such a soil is called peat and because of its high content of organic matter is sometimes used for fuel. Muck soil represents the advanced stage of decay of the organic matter where the material has lost its fibrous nature and become fine and pulverant. All degrees of decay may be encountered and there is consequently a wide variation in the physical properties and, therefore, in the agricultural value of the material.

GENERAL CHARACTERISTICS

The chief characteristics of muck soil may be summarized as follows:

1. It is predominately organic in nature and has a dark brown or black color. The more advanced the stage of decay the darker is the color.

2. It is accumulated under swampy conditions and is naturally saturated with water. The material has a very large capacity for water and will absorb from 60 to 85 per cent. of its volume of water.

3. The shrinkage of the material when it dries is very large. Consequently, when completely drained the deeper deposits may settle two or three feet. Ordinarily the settling is a few inches to a foot or more.

4. The plasticity of the material is low. In the peat material it is especially lacking but is better developed in the muck soil.

5. Muck and peat land is deficient in potash and requires heavy applications of that material for crop production.

6. The climate of muck soil is inclined to be frosty. This results from the position of the material in hollows and from its large water content. Such materials accumulate the cold air in spring, and the warming of the soil is delayed by its large water content.

ORIGIN

The origin of the material is suggested by its primary characteristics. It represents the accumulation of various kinds of plant remains over a long period of years. Upon the death of the plants their materials have been covered by the swamp water where the air is excluded and where antiseptic properties have been developed, both of which hinder decomposition. Decay goes on more slowly than the accumulation and consequently the deposits have been built up from year to year until frequently they have attained depths of 30 to 40 feet. Usually, however, the depth is from 2 to 10 feet.

KINDS OF PLANTS THAT FORM MUCK

There is a considerable variation in the kind of plants that make up muck and peat deposits. They vary not only with different areas but at different depths in the same area. Sometimes they start on the border of a lake and gradually build themselves out over the surface of the water until the lake is filled. In other cases the water is sufficiently shallow so that the first plants find rooting on the bottom and gradually fill the lake with the plant materials. The following types of vegetation have been recognized as responsible for such accumulations:

1. Mosses, including the floating forms that live on the edge of open water. Sphagnum moss is one of the common varieties that contributes largely to the latter stages of muck formation.

2. Grasses and flags. These grow luxuriantly where the water level is near the surface of the land and in time they may form large accumulations. The Montezuma marsh is representative of this type.

3. After the muck and peat has accumulated until it has reached the surface of the water of the swamp and affords a fairly firm foundation, various types of shrub and tree growth develop. When the land is especially wet, cedar and tamarack frequently develops. The latter survives out nearly to the edge of open water.

4. In the latter stages, various hardwood trees are introduced. The more common of these are elm, black ash and soft maple. This latter type of vegetation is generally characteristic of an advanced stage in muck formation. Frequently cedar is interspersed with the hardwood species. The large growth of hardwood trees and of weeds and shrub plants is one of the best indications of the agricultural value of muck soil. When it will support such plants it is very certain to be suitable, with little treatment, for the growth of agricultural crops. Where the vegetation is predominately cedar and tamarack — species rich in resin — the resulting soil is likely to be loose and peaty and has a low agricultural value. It may be that the resinous matter in the wood interferes with decay. Such soil inclines to be dry and has a poor relation to moisture. Where the prevailing timber is hardwood with only an occasional specimen of cedar, the crop value is usually good.

The muck and peat deposits in New York may be divided into two general groups. The first of these is the tide water swamps under the influence of salt water. Flags and grass are the prevailing type of vegetation. They are generally very fibrous and covered by hummocks of plants. The salt water hinders decay. When drained and protected from tidal overflow the salt is gradually washed out by the fresh water from the uplands and from rainfall and the soil becomes favorable for cropping. Areas of this soil have been developed on parts of Long Island.

The other type is the fresh water swamps in the inland part of the state. Some of these are broad, shallow sheets of muck and peat soil while others are small deposits often of great depth. There is often a considerable difference in the agricultural value of these two types. The first, when drained, is likely to suffer seriously from the lack of water because of the poor moisture relations of the material and the fact that the water-table may be too far below the surface. The smaller areas are often bordered by numerous springs which even after drainage keep the water-table fairly near the surface. Such areas are likely to have higher agricultural value.

The wide variations in the character of muck and peat soil are due to the kind of plants of which it is formed and the stage of decay. The stage of decay varies not only with the area but at different depths in the same area. Where the water level has been permanently at or near the surface, the surface soil is a better quality of muck than the subsoil which is likely to be quite peaty. In other cases, however, a better quality of muck soil is found below the surface than at the surface. It is possible that this represents changes in the drainage condition of the area. Some recent obstruction of drainage may have raised the water level and thus renew the process of peat formation. .In the deep areas the lower part of the formation is likely to have lost its peaty nature and it sometimes takes on a dark grayish color and a flaky nature. When thoroughly broken up by tillage such material may make good soil.

There is a considerable variation in the underlying material of muck bogs. In every case the ultimate foundation is a clay or some other compact formation which retains the water. Above this there may be a strata of sand, and in the New York areas, especially through the middle part of the state from Buffalo eastward, deep accumulations of marl are common. These marl deposits are made up chiefly of lime carbonate. Shells of mussels are abundant but the origin of the material seems to be due to the growth of a certain type of moss which precipitates lime carbonate from the swamp water. In a number of the deposits south of Rochester, the marl is many feet in depth, is of very great purity and is covered by only a thin layer of a few inches to a foot or more of muck. The purer deposits are sometimes used as a source of lime carbonate for the soil, for which purpose when dried and pulverized they are entirely satisfactory.

PROPORTION OF ORGANIC MATTER

Special properties. Muck and peat soil contain from 50 to more than 85 per cent. of organic matter. Usually the more peaty the deposit the higher is the proportion of organic substance. The process of decay consists partially in the destruction of the carbonaceous material. The process sets free carbon to which is due the brown or black color of the material. Consequently the muck deposits which represent the more advanced stage of decay have the darker color. The muck also has the accumulation of the ash material which increases its content of potash and other mineral elements. The decay also increases the proportion of soluble material which may be grouped under the general name of humus. The spongy nature of the plant tissues as well as the gelatinous nature of the humus gives the material a very high water capacity which amounts to from 300 to 1,000 or more per cent. of its dry weight. Fresh peat may weigh only 10 to 12 pounds per cubic foot when freed of water. Muck soil has a larger weight and will run from 12 to 20 pounds. The smaller the weight of the dry material per cubic foot the greater is the skrinkage, and this is one indication of the crop value of such land. Material that has an excessive shrinkage should be avoided, especially for intensive cropping, until it has reached a more advanced stage of decay.

CHEMICAL COMPOSITION

The chemical analysis of a large number of samples of muck shows them to contain from 1¾ to 2½ per cent. of nitrogen, from one-tenth or less to five-tenths per cent. of potash. They may also contain from ¼ to ½ per cent. of sulphur. The nitrogen is derived from proteid compounds in the plants. There are no nitrates or nitrites in fresh muck soil and very little free ammonia. The bulk of the nitrogen is in the form of a memo- and mono-ameno compounds, and in the peaty materials a few per cent. of the nitro-compounds, and in the peaty materials a small percentage of the nitrogen may be dimeno- compounds. Under treatment with basic genous organic compounds break down and the ammonia is set free. It is essentially this process that occurs during decay and for that reason muck soil in an active stage of decay is a better medium for plant growth than raw material in which decay is not active. This affords a cue in the management of such soil.

After drainage, which is the first step, decomposition should be promoted by applications of manure or of rich garden soil. Such material is in the nature of an inoculation.

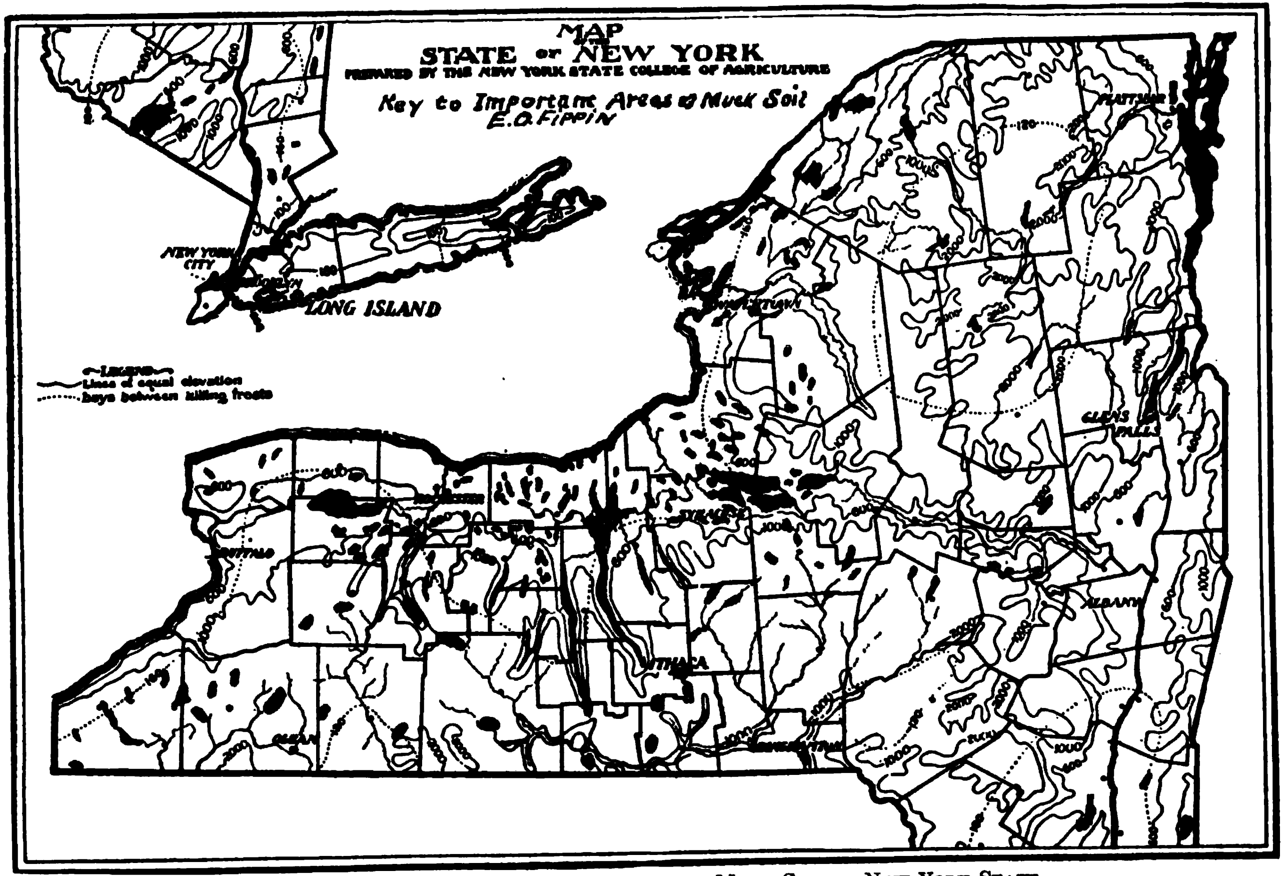

FIG. 352. MAP SHOWING IMPORTANT AREAS OF MUCK SOIL IN NEW YORK STATE

OCCURRENCE

There are in New York State from 800 to 1,000 square miles of muck and peat deposits, and, as suggested above, these are distributed in a large number of areas. They range from areas an acre or more in extent to large sheets containing thousands of acres. Such deposits are most abundant in the northwestern part of the state adjacent to Lake Ontario. A few areas are developed in the southern, eastern and northern part of the state. They are associated with the rough topography where drainage has been much obstructed by glacial action and many of the former lakes and ponds have been filled by accumulations of this sort. The larger areas are found in the Conewango valley in Chautauqua county, in the Caneserago valley in southern Livingston county, the Oak Orchard swamp in northern Genesee county, the Montezuma marshes at the foot of Cayuga lake, Cicero swamp southwest of Oneida lake, Pope Mills swamp, southeastern St. Lawrence county and the Wallkill marsh in the southern part of Orange county. The distribution of such lands is suggested on the accompanying map.

IMPROVEMENT OF MUCK LAND

In the reclamation of muck lands, the following steps must be observed:

1. Drainage. The water level should be lowered to a depth of 15 to 30 inches below the surface. Usually, open ditches are employed and may be combined to form extensive canal systems. It is usually desirable to extend the bottom of the small field ditches below the desired water-table in order to quickly remove the water after heavy rains. A check gate should be installed to avoid the excessive lowering of the water. As noted above, the capillary relations of such lands is deficient so that drainage should be carried out only to the extent necessary to start crops in the spring. The large shallow areas are most critical in this respect and are likely to suffer seriously from lack of water in the late summer. The depth to which the water-table should be lowered depends very much upon the quality of the muck. The more pulverized its character the deeper should the water-table be held. Those small areas fed by springs, and by which the water-table is maintained

at the bottom of the ditches, are most favorable for agricultural purposes. Underdrains of tile or board boxes may be used in those areas where the water-table is permanently maintained at the level of the base of the drain. This prevents the excessive and unequal shrinkage that is likely to throw the drain out of line. Open ditches are the safer form of drainage and should always be used at the beginning of operation. In a few places in the state under conditions mentioned above, tile drains are operating successfully in muck soil. Of course if the muck is sufficiently shallow so that the tile can rest on the solid material below the muck, the use of underdrains is much preferred to open ditches that seriously interfere with tillage operations. In other cases irrigation in some way may be very desirable to secure full crop yields. In some cases it is possible to utilize spring water in connection with open and underdrains as a means of sub-irrigation.

2. Applications of lime in the form of caustic lime are frequently beneficial. The decay of organic matter produces an acid condition which tends to hinder further decay. Lime not only promotes decomposition but aids in chemical changes of the material that liberates plantfood.. One or two tons per acre should be used. Many of the areas in the western part of the state that are associated with marl deposits near the surface probably would not be benefited by applications of lime.

3. A light application of well-rotted stable manure or of rich garden soil serves as an inoculation to promote decomposition.

4. Thorough tillage loosens up the soil and exposes it to aeration and promotes decomposition. Since the material is inclined to be loose, plowing in the fall is preferred where there are no dangers from serious washing. The winter saturation aids in compacting the material. The tillage operations should be aimed to compact the soil which improves its moisture relations.

5. Commercial fertilizers should be rich in potash and should contain a moderate amount of phosphoric acid and nitrogen. The proportion of these will vary considerably with the deposit and the crop. Perhaps the best standard fertilizer in the early stages of cultivation of a muck area should contain from 2 to 3 per cent. of nitrogen, from 4 to 6 per cent. of phosphoric acid in the form of acid phosphate, and from 12 to 20 per cent. of potash.

6. A wide variety of crops may be grown on such soil. Its natural capacity is indicated by the native vegetation. The more peaty deposits will change into muck after cropping and tillage. The high percentage of nitrogen available in well managed muck soil makes it especially suited to crops that are used for their vegetative growth. In addition to vegetables this includes hay, especially timothy, roots and potatoes. With proper fertilization fair yields of corn may be secured. Even bluegrass has been observed to make a good growth on muck soil, presumably areas rich in lime. In the early stages of the development of muck land it is advisable to plant only the stronger feeding field crops such as hay, corn and potatoes. The tillage of the latter aids in breaking up the soil in preparation for the more delicate feeding roots of the vegetable crops. The more sensitive crops should be planted only on the best quality of muck land.

GROWING VEGETABLES ON THE MUCK LANDS

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Though in some sections muck lands have been utilized for vegetable production for several decades, it is only recently that their usefulness has been generally recognized. In most places the swamp on the farm has been regarded as a dead loss. Of late years the movements of vegetable products have ceased to be exclusively from warmer to cooler climates. The states which supply early vegetables to the northern cities find that they cannot produce certain crops for their own use in summer and fall. Accordingly, they must look to other sections.

For the crops which prefer a cool season, the muck lands have proved to be peculiarly adapted, and a large share of the onions, celery and head lettuce which are used in summer, fall, and early winter are grown on these soils. Other crops are grown to a lesser extent, but greater diversification is being practiced every year. Among the additional crops are spinach — chiefly for canning — beets, carrots, cauliflower, potatoes — chiefly for seed — and to some extent cabbage. It is often said that the latter is not solid when grown on muck, but some growers have attained excellent results.

Muck land that is fully developed is usually held at high valuations. In some sections areas have changed hands at as much as five or six hundred dollars an acre. Rents as high as seventy dollars per acre per annum have been recorded. But muck land can be purchased at much lower figures, and one who is seeking a location should cast about for an investment where the interest charge will not be so high. It is necessary to exercise caution to avoid areas that are distant from railroad, or in which the soil is for any one of several reasons unproductive, or where the cost of reclamation would prove excessive.

EQUIPMENT

The investment in equipment for muck land vegetable production varies greatly. Some growers with relatively small areas are highly successful though their tools are few and simple, representing less than three or four hundred dollars for — say ten acres. The buildings may be very simple, providing merely shelter for tools and a room for preparing products for market. Small and simple green houses are used by celery men for growing early plants. Storage houses for onions are frequently built, but this is really independent of crop production, as the gain incident to holding the crop is expected to meet the interest charges and other costs and to offer a profit in addition. Some men build more elaborate storage houses and expensive tool and work rooms, and so increase their investment rather heavily, not always with increased profit.

DRAINAGE

The care of drainage ditches on the muck land involves special consideration. Two general methods are in practice. Most growers maintain a narrow strip of sod, or rather a strip of sod which they pretend to keep within narrow limits, on each side of the bank. Thus the sides may be kept almost vertical. The other method consists in keeping the banks of the ditches shaved clean, thus allowing no harbor for weeds. Each requires about the same amount of space.

There is a growing tendency toward the use of tile drainage instead of open ditches. The latter are objectionable on account of the loss of space, often as much as 10 per cent.; the labor of keeping them shoveled out from year to year; their interference with operations, and on account of the harboring of weeds. It has been found that where tile is well laid, placing the line on a board bottom, the plan is satisfactory, even through the fall is very slight.

Muck soils do not form clods as do the heavier upland soils. Even though the material is very light, plowing is not as easy as might be supposed. The smallest spot of rust on a plowshare is sufficient to start an accumulation of muck which prevents scouring, and before long the implement is merely dragged through the soil without turning a real furrow. Considerable care must be exercised in selecting a plow for these lands, some models being much more satisfactory than others, although there is quite a little difference of opinion as to the adaptability of different makes and shapes. Some are using disc plows with a high degree of satisfaction.

FALL PLOWING AND CULTIVATION

Fall plowing is favored by some gardeners, advantages suggested being that the work is done and off the calendar before the rush of the spring months; that the land plows a bit more easily; that freezing in the furrow is useful, and that there is less trouble from weeds. On the other hand, some claim that spring plowing aids in drying out the soil more speedily.

Great emphasis is placed upon the advantage of careful preparation of the soil. A level surface is especially important on account of the delicate seeds and plants. On one of the experimental plots of the College of Agriculture, a small area was found to be deficient in yield. The situation was studied a bit, and it was discovered that a very slight depression existed at this point. After this was filled, it was found that the difficulty had been overcome. The plank drag or float is widely used, and some employ a scraper consisting of a plank so attached to a frame that the edge acts as a blade reducing mounds and filling depressions. The roller is regarded as very valuable for compacting loose muck soils. The Acme harrow is one of the favorites for finishing.

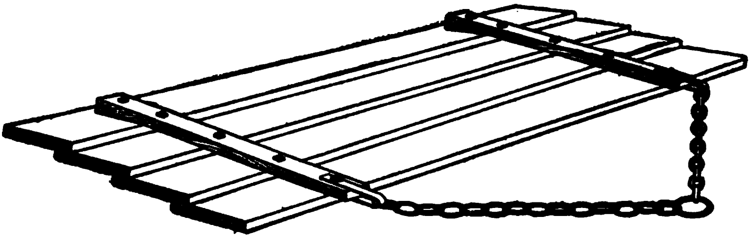


FIG. 353. PLANK DRAG

This bulletin includes articles on the leading muck land crops, and each deal with their special fertilizer requirements.

The peculiar moisture relations prevailing in muck soils render careful cultivation no less necessary than on other soils, even though the water-holding capacity is exceptionally great. The capillary movement is so slow that the upper soil may be suffering severely when abundance of water is to be found a few feet beneath. Thus the conservation of the moisture which exists in the parts of the soil where the roots are most highly developed is not to be neglected, and cultivation usually insures sufficiently favorable moisture conditions for high production without irrigation, although some practice artificial watering.

The maintenance of a surface mulch on muck soil is exceedingly easy. The material itself is well adapted for the purpose; in fact, the coarser muck soils would be found effective for the mulching of other soils. Only a very light crust is ever formed, and the lightest tools are adequate. The intensive planting plans practically banish the horse cultivator on many farms, celery being the only important crop for which it is used. Wheel hoes are very widely employed. Different attachments are used at different stages of the crops, among them being sets of small discs, of light, slender teeth, mold boards which throw a considerable amount of soil to or from the row, and also blades which pass just beneath the surface, cutting weeds and leaving a fine mulch. A two-wheeled tool is best for straddling the rows, while a single wheel is better for working in the middles. When crops begin to close the middles, a single wheeled tool, known as the gooseneck, is used. The frame consists of a single bent tube, and it carries a blade which passes immediately beneath the surface.

The most widely used of the hand tools is the scuffle hoe or shove hoe, as it is commonly known. This consists of a handle, a shank, and a flat blade similar to that just described from one and one-half to three inches wide and from six to twelve inches long. The shank is riveted to the blade in such a way that it is pushed in a horizontal position ahead of the worker. This passes readily beneath the foliage and is exceedingly useful in this type of soil. Ground may be covered very rapidly. Another tool that is used for thinning and for working beneath plants in the row is a hoe which consists merely of a narrow strip of metal bent in the form of a triangle and set in a handle.

An enormous amount of hand weeding is necessary for closely planted crops. Especially is this true of onions and of celery.

When heavy winds have drifted the muck so that young celery plants are partially covered, the soil must frequently be removed by hand.

IRRIGATION

As just suggested, most growers are able to procure a good crop by the conservation of moisture through good cultivation. However, an increasing number feel that the losses incident to drouth are sufficient to justify the installation of irrigation equipment. The overhead type of irrigation is but little used. Many control the water table by opening or closing the outlets of the ditches. The water level may be raised quite high before planting a crop, thus filling the soil with moisture. It is then lowered and maintained at a level of say eighteen to twenty-four inches. An occasional grower employs a furrow system, distributing the water from a head ditch through the middles. This scheme is quite satisfactory if the pumping cost is not high. It is a little difficult to secure even distribution of water throughout the whole length of the ditch. The water ought to be so handled as to flow from one end to the other very promptly. Then it will be gradually absorbed all along the line.

CROPPING PLANS

The arrangement of crops on muck land varies greatly in different districts. In some places single crops are grown almost exclusively. Thus the marshes of the Wallkill river in Orange county are used chiefly for onion production; the same statement may be made of the Canastota swamp; Fulton and Albion have been widely known for their lettuce, and Arkport for its celery. However, there is a marked tendency toward diversification. Except in the warmest parts of the state, it is difficult to grow a second crop after onions have matured, although some are willing to take a chance on securing a good yield of spinach, since the cost is very low. Two crops of lettuce may be matured without difficulty, and in some cases three. Celery is sometimes sowed after a crop of lettuce or vice versa. Occasionally lettuce is planted every fourteen inches apart, but every third row is omitted. In this wide space the celery plants are set. Thus the two crops occupy the ground together for a few weeks. A double row of lettuce is sometimes sown on celery ground after the boards have been placed for blanching, but the removal of the celery renders this more or less unsatisfactory.

MARKETING

Muck lands seldom lie within hauling distance of the market, and the different problems of transportation and of sale through dealers and commission men must be met. The muck land grower seldom sees his merchant face to face, and the long time in transit usually prevents his taking full advantage of the ups and downs of a particular market. In fact, it often happens that on advice of a high market, growers ship just in time for their product to contribute to an over-supply incident to the wide distribution of the information which they have received. It is needless at this point to dwell upon the problems of selling on distant markets. Suffice to say that men who are producing in fairly large quantities and who are using good business judgment in working out their market problems are able to secure fairly satisfactory results. Nevertheless there is something radically wrong when celery that can be profitably grown at one and one-half cents per head costs the consumer eight or ten cents, and when lettuce from western New York makes it way to Boston and back to Syracuse before it even falls into the hands of a retailer.

Some growers have found it profitable to build up a clientele of small jobbers and larger groceries to whom they ship directly. They have given special attention to the growing of a high-class product and to its preparation for market. This plan involves much attention to detail and is for this reason not favored by some.

Muck land production offers exceedingly favorable opportunity for cooperative marketing. No notable success in this direction has been recorded on any of the muck land areas of New York, although the upland growers of Chautauqua and Erie counties are finding the South Shore Growers' & Shippers' Association exceedingly helpful.

THE CANNING INDUSTRY FROM THE GROWER'S STANDPOINT

S. J. Cook

Secretary-Treasurer of South Shore Growers' and Shippers' Association, Silver Creek, Chautauqua County, N. Y.

The growing of fruit and vegetables for preserving and canning in the United States and Canada has, in the last ten years, become an important industry. Hundreds of factories have been erected in many states, and hundreds of thousands of acres are devoted each year to the growing of canning crops. There were packed in the United States in 1914 approximately 25,000,000 cases of the three vegetables — corn, peas and tomatoes — and approximately 4,500,000 cases in Canada. These, coupled with other important vegetables, such as string beans, beets, asparagus and kraut — to say nothing of the berries of all kinds, and other tree crops — give one an idea of the magnitude of the canning industry in this country.

All manner of men are engaged in the undertaking, and there are all kinds of canning factories — from the cheaply constructed shed to the enormous, up-to-date, sanitary establishments constructed of concrete, brick and iron, covering acres, and capitalized by large corporations with millions at stake. No industry has made greater advancement in the manufacturing of its products. Inventors, expert machinists and manufacturers have designed and perfected the most modern machinery for the manufacture of canned products. A few of the larger preservers and canners manufacture their own bottles and cans. There is also great improvement in the matter of sanitation; likewise in the quality of the finished products. Many of the larger plants invite public inspection.

Much publicity has been given the merits of canned fruits, which has had a tendency to increase the consumption. A large part of the population in the cities depend almost wholly on canned goods the larger part of the year, and the canning business has grown beyond the expectations of the best informed men in the business. Undoubtedly, it will continue in its growth. That the business has proven profitable is to be seen by the large fortunes acquired by those interested in canning and preserving.

The canning business of this country represents enormous crops, wonderful manufacturing output, superior salesmanship, and, while the cost of staple articles of food is ever increasing at an alarming rate — notwithstanding all the efforts that have been made to increase the production of the soil — such increase in the cost of living cannot be laid to the canner. On the other hand, he is a public benefactor.

There are exceptions to the rule, however, in the canning business. What I will say now represents the grower's interest and the unfairness on the part of the canner in his business dealings with the grower, and I trust that it will not be taken as antagonistic. We, as growers, are all interested in the welfare and advancement of the canning industry in this state, and are in a large measure dependent upon the canneries for the sale of our products.

RELATION BETWEEN THE GROWER AND CANNER

The canners have made it possible for us to grow thousands of tons of perishable fruit and produce, and that at a contract price; but have they always been just and fair in their business dealings with the grower? I think not. On the other hand, has the grower always been fair with the canner; has he delivered all of the crop contracted for? No, he has not. I shall say something in regard to this later.

Where climatic conditions and soil are adapted to the culture of such crops as tomatoes, peas, corn — in fact all vegetable crops — and a fair price is paid by the canners, many growers have made money. But, on the other hand, there are localities where canners and perservers have taken advantage of individual growers in price cutting, unfairness of contract, failing to furnish crates to harvest and deliver the crop, refusing to pay the grower for his produce until the canned products were sold, thereby making the grower help finance their business — in fact their contracts with the growers were often " jug-handled " affairs. They were in position at all times to dictate in the matter of contracting for tomatoes. If the grower's crop happened to be late and the canner had received from other growers about all the tomatoes he cared to pack, he would at times refuse to receive any more tomatoes under any consideration, although the quality of the fruit might have been of the best. The same holds true with corn, peas and some other crops.

Contracts for produce are generally made with the grower two or three months previous to the planting of the crop. If the canner desired a large acreage of peas and the contracts were not forthcoming from the growers, he would refuse to take a contract for tomatoes, unless the grower agreed to contract for a certain acreage of peas, or vice versa.

There are many other instances of unfair treatment, such as having to wait long hours in line when making delivery, and, after having done so, have the inspector inform you that he would be obliged to cut you two or three dollars a ton on the load as the tomatoes were not as perfect as they should have been and did not conform to the contract. I have had my own load of tomatoes turned down for no other reason than to help eliminate the large loss which was occurring daily on account of deterioration of the fruit, the canner being unable to properly care for the tomatoes. The accumulation of a large over supply at such times invariably caused a loss which the grower was asked to help sustain. Such discrimination and unbusinesslike management on the part of the canner has had a tendency to create great dissatisfaction, and where growers are obliged to stand for treatment of this kind there is not a likelihood of making much money in growing tomatoes for the canneries.

The grower, as an individual, is not in position to make demands on the canner; he will be given to understand that he is not running the canning factory — in fact, he is not taken into serious consideration. If he does not like the treatment accorded him he can, of course, refuse to contract next year, but that does not help the present situation.

What I have said of unfair treatment of the growers by the canners is, undoubtedly, the exception rather than the rule, but in dealing with canners of the type mentioned many growers have made but a scant living, and have not received an adequate return for their labor or investment.

The growers in this locality found that the whole solution of their troubles was to cooperate, which they did.

ADVANTAGE OF COOPERATION

By cooperation the growers bettered all conditions. They received one dollar more per ton for their tomatoes than they had been previously paid and were given a better contract. In this contract the preserver agreed to receive all marketable tomatoes to a certain date, and further consented to a two-payment clause in the contract — payment for one-half of all tomatoes delivered up to September fifteenth, and the balance within ten days after the remainder of the crop had been delivered. They also agreed to furnish packages. In fact they were much more congenial and businesslike than they had been, and there was really a change in business, which was, I believe, for the good of all concerned.

Cooperation is a necessity in some localities; growers have been compelled to either "get together," or go out of the business. Canners as a rule do not advocate dealing with a cooperative association; in fact they have been more or less antagonistic. But I believe the time is not far distant when they can be made to see the efficiency and wisdom in doing so — as soon as it can be shown that a policy of this kind takes into consideration fairness to the canner.

If the growers are to demand fair play they must in turn do their share, and while an association is, undoubtedly, in a better position to maintain a fair price for its products and demand fair treatment for its members, it should at all times apply good sense in conducting its business. We must not ask an exhorbitant price; the canner must receive the raw products within certain limits of cost, and the treatment accorded him should be in the light of a prospective partner. Further, we should make no distinction in the matter of fair dealings between that accorded the canner and our own members. We should deliver good quality produce, goods that would please, rather than to try to get rid of poor, unmarketable products.

The growers have not always been fair in matters of this kind. They have at times tried to deliver any but quality produce, filling bottoms of containers with poor rubbish and topping off with standard grade fruit. They have also shipped large quantities of contract produce to the open market at an advanced price, and at other times have overloaded the canneries with a large supply that possibly came from an adjoining field and was not contracted — in direct violation of their contract.

A cooperative association must have some rule of fairness; must have a reputation for fair dealing; must be dependable and have fixed business principles which serve both the buyer and the seller. Our plan is to enter into an agreement with the canners and preservers for a specified number of acres of produce at a stated price. The conditions governing the contract cover varieties, delivery, loading station, baskets for delivery, right of the canner to measure acreage, quality of fruit or produce and terms of payment.

In the matter of contracting with our members, each one is required to sign a binding contract specifying acreage and agreeing that all produce marketed at canneries shall conform to the standard and conditions as set forth in the contract made between canneries and the association. We found it was necessary to have a stringent contract.

With us cooperation has made possible better business methods. It has likewise been a benefit to the canner. He now receives better quality produce; he is not disappointed in his acreage by being informed at the last minute that the grower failed to plant his crop; his expense in securing acreage with the individual growers is lessened, and improved methods of production and grading have given him better uniformity, which has greatly improved quality. The management has interested canners and preservers in distant cities and towns in the purchase of our products. This has increased the acreage in production from year to year, which has added to the prosperity of the growers, and all classes of our citizens have shared in the prosperity. The railroads have profited by the increased freight tonnage resulting from industrial activity, based on agricultural prosperity; manufacturers of farm machinery and implements have been interested; the manufacturers of commercial fertilizer have greatly increased their tonnage in this territory; and the retail merchants who sell to the farmers, likewise the banks, receive their share by the increase in business. In the past three years we have demonstrated that cooperation for the growers will furnish an agency strong enough to control their products from orchard or field to market.

CANNING ON THE FARM

C. O. Warford, Newburgh, N. Y.

ADVANTAGES OF A FARM CANNING OUTFIT

Have you ever noticed how two men with practically identical loads of vegetables will go to the same market, and when the market closes and their loads are sold out, one man will have in his pocket as the result of the sale thirty dollars, while the other man will have but twenty or twenty-five?

We say it is good salesmanship, but is it? Perhaps it is, but many times you will find back of it all another and a better reason, and that is confidence. One is given confidence because he is the possessor of a canning outfit and knows that if

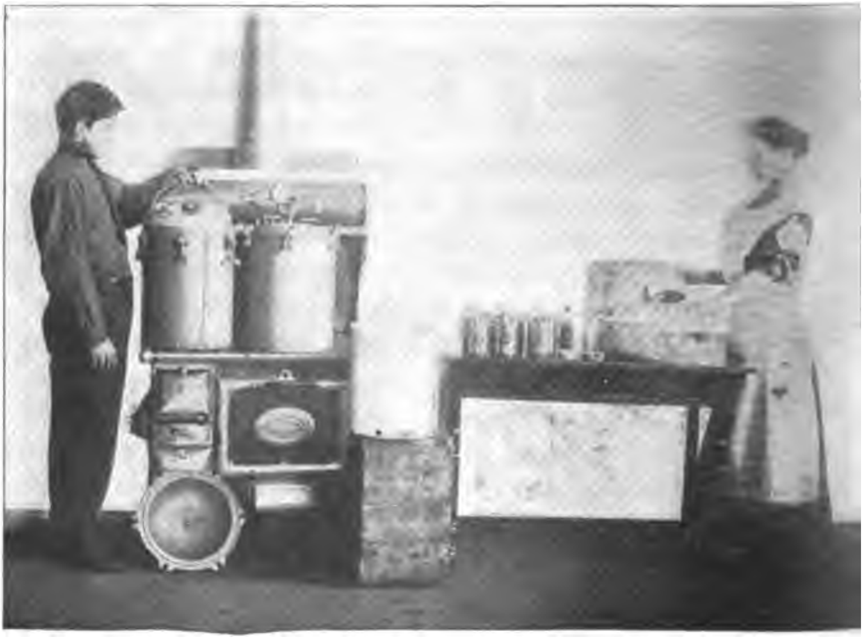


Fig. 354.— A Canning Outfit in Operation

he holds his goods rather high in market and the buyers pass him by he can take the vegetables back home and can them at a profit, while the other man who has no canner knows that if he does not sell his goods on the market he will have to dump them somewhere at a dead loss. The consequence is that he takes about any price the purchasers care to offer him.

The ownership of a home canner gives a man backbone when he goes to market. In all transactions it is a principle well established that one or the other sets the price. A willing buyer makes a fair-priced article while an anxious seller reduces the purchase price. In all lines but farming the seller sets his price which will cover the cost of production, but when it comes to the sale of farm produce many times it seems as though this rule was reversed, for the price seems to be set by the dealer who says, "I will give you so much." And because the producer has no other place to sell, nine times out of ten he will take the price that is offered, even though he may know it is below cost of production. Then he will go back home to produce more goods at the same low offering. This I believe is wrong. I believe that every grower is entitled to a price that will cover cost of production, and the home canner will help him obtain it.

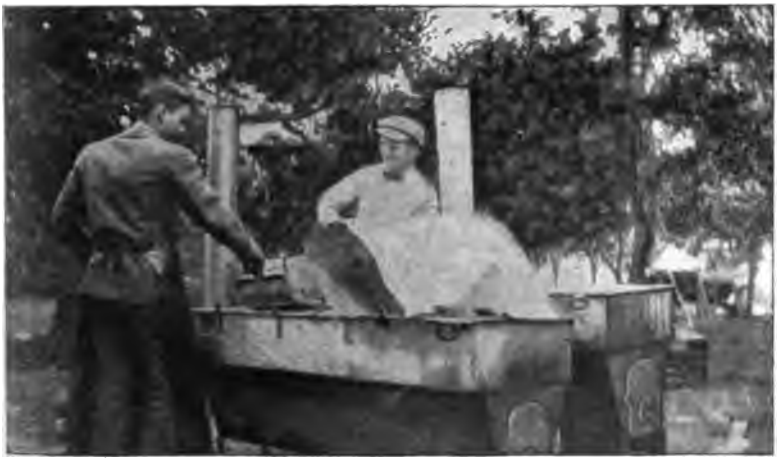


FIG. 355.— EVERY ONE BECOMES USEFUL IN THE CANNING SEASON

The possession of a home canner makes a home market that will cover cost of production, and whenever the city market offers less than this cost the owner can refuse to sell, take his goods back home, set his canner at work and get a fair return for his crops and labor.

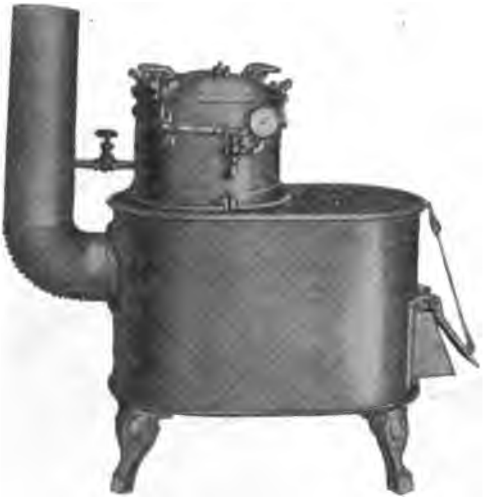


FIG. 356.— STEAM-PRESSURE CANNER WITH FIREBOX. FOR CANNING IN MEDIUM SMALL QUANTITIES, EITHER INSIDE OR OUTSIDE THE HOUSE

Another great advantage of having a home canning outfit to care for the surplus is the fact that the fruits and vegetables in the can keep the grower's name before his customers all winter when he is out of the market with his fresh stock. Many men grow only crops that are marketed through a period of three or four months in the summer and then they drop out of the market for the remainder of the year. During this time their regular customers forget them and when they start back on the market next season they are practically strangers. With home canned foods to place on the market all winter their name is kept before the consuming public, and when they start back next season everyone knows the farmer who produces fresh farm products in summer and canned foods in winter.

But best of all, the home cannery helps reduce the cost of living, for it is one of the means of saving waste products. By waste products I do not mean cull or defective fruits or vegetables, but fruits and vegetables that are not just in the condition that the market demands. For instance, a man may be shipping tomatoes to market; for this purpose he must have them partly green. A dead ripe tomato in this case is a loss for it will not stand shipment, while a tomato of this kind is in the very best condition for canning, since it has the color and the flavor.

Canning saves this. In bunching beets the small ones have to be thrown out and these are the very best for canning as they are the most tender. Broken stalks of rhubarb are unsalable but they are perfectly proper for canning. Canning these waste products is true economy and if saved on every fruit and vegetable farm in the United States would add many million dollars to our national wealth each year and fill many hungry mouths.

EQUIPMENT

A person who wishes to try out the matter of home canning need not go to the expense of spending many dollars for an outfit. Anyone can try out the problem at an expenditure of less than five dollars for equipment. Every farm supposedly has a wash boiler or if that is not to be obtained a common farm kettle may be used. Hot water is the great requisite. The capacity of any outfit, either for home or commercial canning, is the amount of water that can be boiled in a given time.

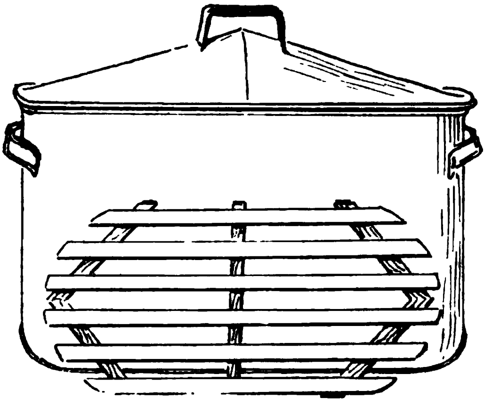


FIG. 357.— THE CLOTHES BOILER USED AS A STERILIZER, SHOWING FALSE BOTTOM AS A RACK

Suppose, for instance, one wishes to can tomatoes. He must have some place where he can wash the raw tomatoes as they come from the field. On a small scale this can be done by placing them in a tub of clean water, stirring them and then removing. They are then ready for the scalding. For this process they are placed in a small wire basket — a clean market basket will do — and the basket is dipped in boiling water. It should be worked up and down several times until the skins of the tomatoes show small cracks in places. Any boiler or farm kettle will do for the purpose of holding and heating the water for scalding.

Next in order is the peeling. A clean table is needed for this on which may be placed pans large or small for emptying the scalded tomatoes so that those who are to peel may work to advantage. Peeling is somewhat of an art. A short knife with a blade about two inches long is the best tool. The peeler grasps the tomato in the left hand with the stem end away from the palm, the blossom end lying in the palm of the hand. The knife should be held as nearly parallel to the line of the core as possible, and should be run into the tomato only deep enough to remove the core without opening up any of the seed cells. If the tomato has been properly scalded, as the core is being removed, the skin will leave it and be left in the palm of the hand when the tomato is dropped into another pan which is used to hold the peeled stock:

Next the tomatoes are packed into cans, after the cans have been thoroughly washed. In packing the tomatoes a small quantity of the juice from the peeled stock is first placed in the bottom of the can — about two tablespoonfuls of juice is about correct — to fill the spaces between the tomatoes as they are placed in the can. If this juice is not placed in the bottom of the can it is almost impossible to have the can turn out full when cut and emptied.

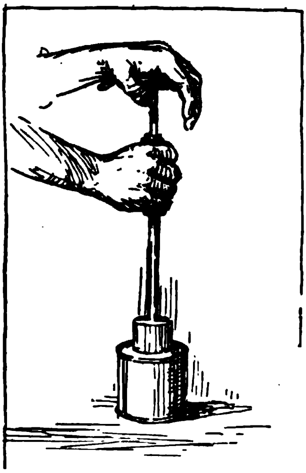


FIG. 358.— CAPPING A CAN WITH ROUND CAPPING STEEL

Next in order after filling is thoroughly washing or wiping off the tops of the cans. If this is not done the operation of capping or soldering the top in place cannot be properly performed. Next the cap or so called top of the can is soldered on. When purchasing cans the little tops or caps which cover the openings in the ordinary cans should be ordered sent with solder enough on their edges to fasten or seal them to the cans.

Soldering is performed as follows: A tool is used, called a capping steel, which exactly fits over the cap to be soldered on the can. It is heated to the required temperature either by a plumber's gasoline furnace or by a charcoal furnace. The latter may be a homemade affair made by cutting a hole in the side of an old milk can so an opening may be made large enough to cause a draft and accommodate the soldering steel. The caps or tops are placed on the cans where they fit into little grooves made to receive them and hold the solder. After the caps are in place, a few drops, about three, of what is known as soldering flux is lightly brushed along the edge of the cap and over the solder to facilitate the flow of the solder and make a smooth finish. This flux can be purchased ready-made quite cheaply or may be made at home, but the commercial article is always purer and better owing to the superior facilities the manufacturers have for making it.

The cans now are ready for soldering. If the capping steel is at the required degree of heat it is taken from the furnace and dipped into a powder or mixture made of some scraps or pieces of solder and granulated sal ammoniac. If the hot steel is turned around in this mixture several times it will come out covered with a bright silvery film of solder. A further dipping into a can containing some of the soldering flux before mentioned, or even a wiping off with a damp cloth will add to the cleanliness of the steel and help make a better job of the capping.

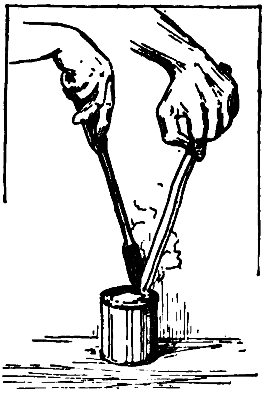


FIG. 359.— TIPPING A CAN WITH SOLDERING IRON AND SOLDER

Now insert the rod which comes with the steel and cover the can cap, revolve the steel once or twice over the solder, lift the steel, holding the cap in place with the center rod until the solder cools and you will find the cap firmly fastened in place. In the center of each cap is left a little hole or vent. This can now be soldered up and the cans be given the final cook, but the best and most approved way is to place the cans in boiling water, leaving the centre hole or vent open. Immerse the cans in the water so that only about a half inch of the top is sticking above the water. Leave them in the water about three minutes. This is what the canners call "exhausting," meaning expelling the air from the cans. As soon as the cans are placed in the boiling water the heat penetrates the contents with the result that they expand, forcing the air from the can. The cans should then be removed and the little hole or vent closed at once with a drop of solder, after which they should be returned to the same or another kettle for their final cook or " process " of thirty-five minutes, the time of process being taken from the time the kettle again starts to boil after the cans are placed therein.

When goods are removed from the kettle at the end of the thirty-five minutes a stream of water should be turned on the cans to rinse and in a measure cool them. When the cans are cold the ends will be found to be concave, due to the fact that the air forced out by the exhausting left a vacuum when the cans cooled, and the atmospheric pressure from the outside keeps the ends pushed in place. If the exhausting had not been done the goods would have kept just as well, but the pressure on the inside and outside would be equal when the can cooled, resulting in the ends not having the finished appearance which they should have, and good appearance is a great factor in marketing any product.

FIG. 360.— GIRLS OF THE NEIGHBORHOOD WERE CALLED IN TO HELP

Of course there are many machines for performing each of the several operations in canning but these machines cost money and a person with ordinary intelligence can many times pick up about the farm articles enought to make a fair homemade outfit which, although not quite so convenient, will do as good work — so far as quality of product is concerned — as any of the highest priced commercial outfits. Quality of product in canning depends more upon the man in charge of the outfit than upon perfection of machinery employed in the various operations.

It probably will be necessary on the ordinary farm to purchase the capping steel and the tipping copper, total cost $2.50. The natural ingenuity of the farmer will suggest the rest. Whatever outfit is secured, homemade or commercial, the idea of cleanliness should be paramount.

CLEANLINESS AND BETTER DISTRIBUTION

The keynote for the owner of the farm cannery should be "improvement of quality of product." Make "quality" the motto, and increase of demand and output is sure to follow. As soon as a person learns the business and its possibilities he will not be satisfied until he has an up-to-date cannery with all the improved sanitary machinery. The method of preparation and process for tomatoes applies practically to all fruits and vegetables with the exception that the cook or process for the fruits varies somewhat, being twenty minutes for pears, fifteen for apples and about the same time for berries.

Other vegetables require a longer time than tomatoes and some of them need a higher temperature than boiling water, which high temperature can be obtained only by using closed top pressure kettles.

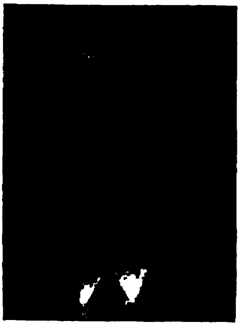
The state experimental stations or the U. S. Department of Agriculture will furnish full information regarding the canning of any special crops, on request.

The demand for the so-called specialties — spinach, string beans, beets, sauerkraut, also rhubarb and apples in gallon cans for pies — is rapidly increasing and are articles which the home canner can try to advantage. It is not necessary that a person own a canner of great capacity or that he run it all through the season to have it show a profit. A home canner, even though it may stand absolutely idle during the entire season, many times will show a handsome return from the fact that the owner knows that there will be no such thing as an unsold surplus while he owns a cannery. When the time comes that every fruit and vegetable farm has a cannery attached — and it is sure to come as soon as the growers begin to study economics — then will come the day when everyone will realize that there is no such thing as an over-supply of any article of food. Overproduction and surplus supply have been bugbears to us simply because we have never thoroughly studied out the best methods of distribution. We apparently have considered it absolutely necessary to rush our crops upon the market as soon as they were ripe, surfeiting the consumer with our abundance, so that he, many times, was sick of the sight of our goods; and then for the rest of the year we have let him go hungry for the same goods because we had not the products to supply him.

With the possession of a home canner these conditions are changed. If, when the fruits or vegetables are ready for market, the consumer is ready to use them, well and good; the grower can supply his needs. If the consumer for any reason does not wish the fresh articles, or the supply happens to be too abundant, well again; for the grower can keep at home the portion that is not needed, place it in the cans, and later in the season when the consumer calls for the various articles, the farmer has the food for him. No overproduction at any time, for improvement has taken place in the method of distribution.

WHY ORGANIZE A CANNING CLUB?

E. H. FORRISTALL, CORTLAND, N. Y.
Farm Bureau Manager, Cortland, N. Y.



The canning club movement had its inception with Mr. O. H. Benson, Washington, D. C., who is in charge of boys and girls' club work, and has afforded educators of all lines of work the best opportunity to successfully meet the needs of the day with an education back to the soil and into the home.

The formation of the club should be in the school, but fortunately it may be adapted to community interests, husbanded by the church, local grange, or by a few interested people who are public spirited enough to secure the advice and help on organizing a club, so gladly given by the State College or the Department of Agriculture, Washington, D. C., and which means so much to those enrolled. The movement should not, under any circumstances, be undertaken unless some leadership is assured whereby the plans submitted can be carried out.

Organization of the girls of twelve years or older under a local leader should be perfected in the winter months, and each member supplied with literature on the subject. Headquarters should be centrally located and be supplied with a stove, fuel, cold water and a canning outfit. The project will best succeed when the girls are encouraged and allowed to rent a small piece of land at home on which to start their garden.

The first year it is best that everyone grow tomatoes because they afford so many practical lessons, such as starting the plants, fertilizing the soil, transplanting from boxes or cold frames to the garden, the cultivation and training of the plants, spraying for plant diseases, marketing the fresh product (always to be encouraged when price warrants), and the canning of all surplus in glass or tin. Members should keep careful accounts of all expenses and

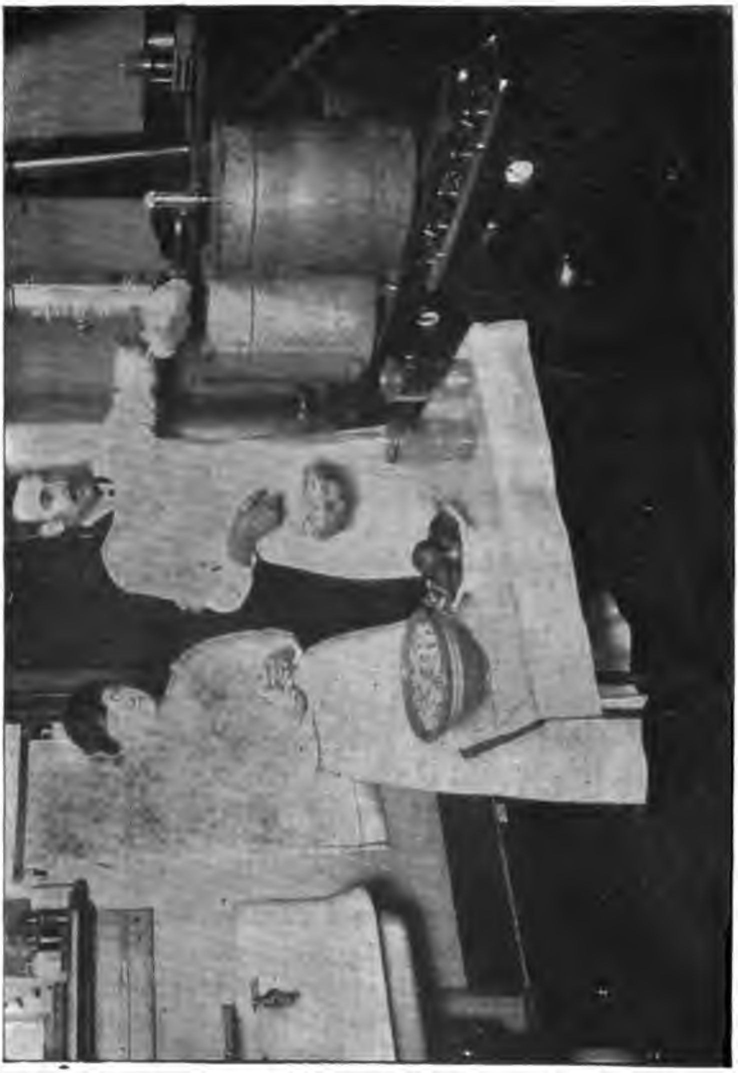


FIG. 361.—DEMONSTRATING THE CANNING OF APPLES. WHOLE APPLES READY FOR BLANCHING. SLICED APPLES TO BE CANNED FOR PIES

receipts, and report at the end of the season's work to the local leader.

Such a project vitalizes school work, makes it easy for the school teacher to reach the home, bridging that awful gap between the school work and the parents. It trains the girls to work together, to follow plans laid out by leaders, employing new and tried out methods which always find their way into the home.

Our girls, especially, should be interested in canning club work, and if they become members of the club that is being instructed by one who is appointed for that work, they are receiving help that their mothers are often unable to give them because most of the canning has to be done at the busiest time of the year. Then too, the girls are learning the shortest and best methods of canning which saves labor and time, and the products canned by this approved method are superior to those put up by the old methods.

Home canning takes care of surplus meats, products of the garden and fruits of the orchard. The windfall apple that heretofore has never been utilized, can be turned into a canned product and used in many different ways.

Vegetables and fruits that are very plentiful cannot possibly be utilized in their season, and will go to waste if they are not canned.

A splendid method of cooperation is to organize boys and girls into market garden clubs. Their members grow and sell their vegetables to the members of the canning clubs who have no time to care for a garden and are glad to be supplied with products fresh from the garden, instead of those brought into town by rail or over a long, dusty and sunny road and have lost much of their freshness. This procedure is of mutual benefit to both the garden and canning clubs.

Some very good canning outfits are manufactured which clubs are using with marked success. However, such an outfit is not necessary for home canning. A washboiler with a tight cover is very satisfactory. If the cover is not quite tight, a piece of cheesecloth should be put over the top of the boiler and weighted at the corners. Then, when the cover is put in place, very little steam will escape. A wooden rack should be madė and placed in the bottom of the boiler so that the cans will not come in direct contact with the heat.

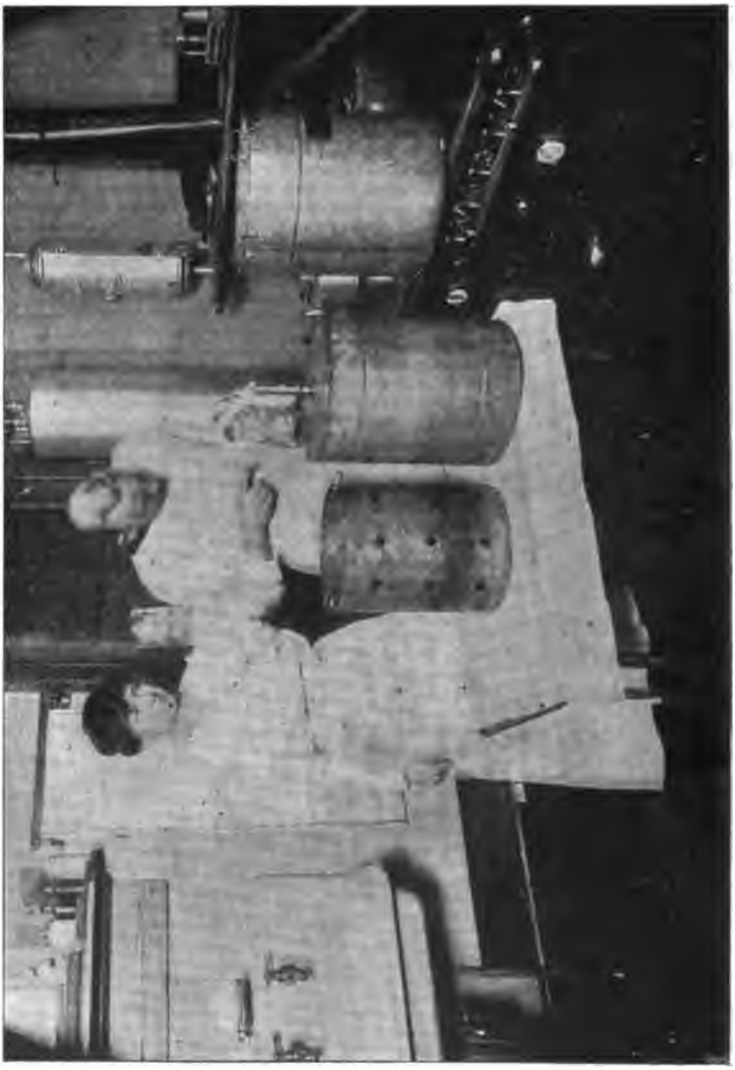


FIG. 362.—THE FINISHED PRODUCT

The business training that results from work in the canning club is worthy of our consideration. Members should keep a record of all expenses such as cost of product (if purchased), materials such as sugar or salt, jars, rubbers, labels, etc. Every hour spent in canning should be recorded and be included in the same expense account. Receipts will include fresh vegetables or fruits sold, and canned products sold. If accurate records are kept, each member will know the value of her canned product; and by comparing the cost per can with what she would have to pay at the store for the same thing, she could determine how much she had saved by canning at home.

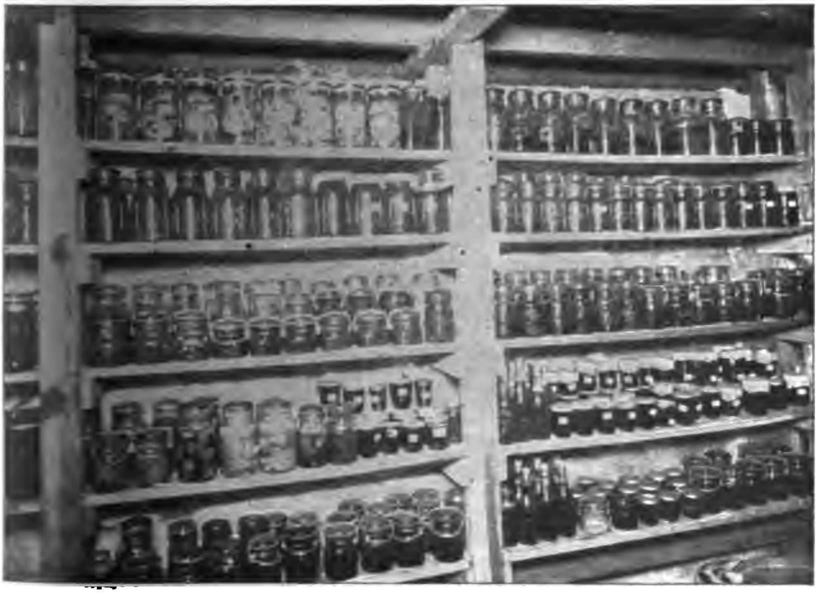


FIG. 363.— A CLUB MEMBER'S FRUIT CLOSET, REPRESENTING ONLY ONE-HALF OF THE SEASON'S WORK. PHOTO TAKEN JANUARY 9, 1915. NOTE THE PICKLES, MEAT, VEGETABLES, FRUITS, JELLIES, CONSERVES AND GRAPE JUICE

The keeping of these accounts results in the houswife giving more careful attention to the elimination of many unnecessary expenses and seeking to be more economical. The simple accounts such as they have been keeping in the canning club work illustrates to them their value, and arouse a determination to keep household accounts, something to which heretofore they have given little or no attention. This new resolution backed up by actual experience is not so easily broken or forgotten as the resolution adopted by so many women when they determine to keep a record of expenditures for the coming year, only to give it up after two or three entries have been made.

The item of time spent in performing household duties should never be lost sight of and is a valuable part of household accounts. When a woman is hired by the housewife to do any particular work, account of the time spent is considered and she is paid for what she has done. How seldom it happens and yet how important that the hours spent every day by a woman in her home should be valued. If they were, more thought would be given to the saving of steps by the proper arrangement of stove, cupboards, work table and sink in the kitchen so that the fewest possible steps would be needed to accomplish the greatest amount of work.

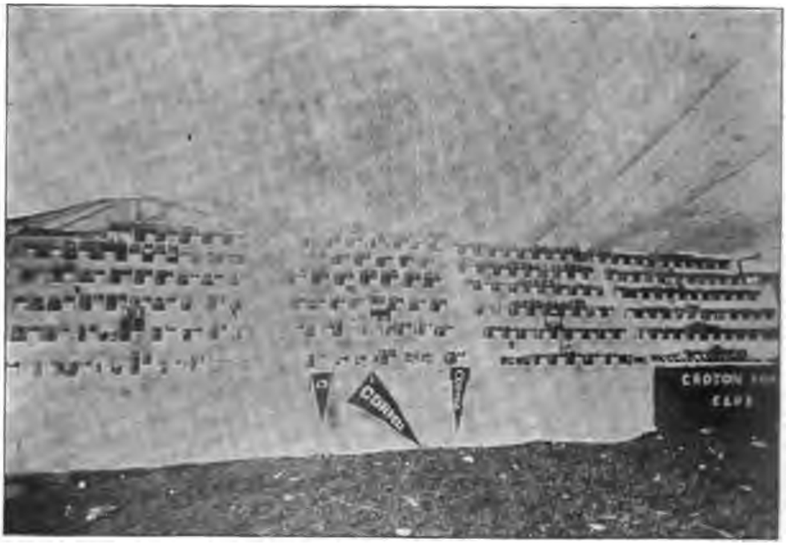


FIG. 364.— CANNING CLUB EXHIBITS IN THE FARM BUREAU TENT. CORTLAND COUNTY FAIR

We should not forget the social benefits of the club. The opportunity afforded of merely coming in personal contact with the older and trained mind of the instructor has a great influence on the younger person whose mind is plastic, and when her interest is aroused in any particular work she is eager to accomplish and perform her everyday duty in that same pleasing, easy and forceful manner.

When the women come together in their meetings, valuable ideas are exchanged. They enjoy the sociability of the occasion, and oftentimes members who have had splendid thoughts on the home life had never before shared them because no opportunity has presented itself. Many a woman, as she goes about her home performing the tasks of the day, has ideas suggested to her that often would never find expression except through the medium of the club. There is rest and recreation in leaving the cares of the home for an afternoon and mingling with friends. The housewife returns to her home refreshed and with many helpful suggestions, and the work of the coming day is anticipated with pleasure.

The farm bureau in cooperation with the domestic science department of the New York State College, organized eleven canning clubs in Cortland county in 1914, with a membership of 284, which comprised both women and girls. In two clubs, sales agents were appointed to take care of those customers who wished to purchase the superior product put up by club members. The sales of one member, made to some of the best families of the city, have already amounted to over $40, establishing a cooperation between the women of the country and the city.

Meetings in each club were held regularly every two weeks. Miss Bertha E. Titsworth of the State College was the instructor. The meetings were held in a grange hall or in the home of some member. As products appeared in season, Miss Titsworth demonstrated the canning of them, at which time the members assisted. Questions were asked and answered, and the time intervening from one meeting to the next was spent by the club members in their homes canning their products according to the methods demonstrated.

A report of every club meeting was made to the farm bureau by Miss Titsworth. It included the name and place of club, membership, number and names of members present, number of visitors present, what products were canned for demonstration, and some of the questions asked by the members.

The canning of meats is now being done very successfully by the club members. We were informed only yesterday that they were filling the cans as fast as they were emptied of fruits and vegetables, with meats to be used next summer; thus making use of the glass jar the entire year.

VEGETABLE FORCING IN NEW YORK STATE

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SUGGESTIONS FOR IMPROVEMENT

No other branch of agriculture has made such rapid forward strides during the past decade as has the vegetable forcing industry. Twenty years ago one could find only small vegetable houses, and very few of those, near our larger cities; whereas today there are many acres of land farmed under glass. Still there is room for much more development, since the demand for greenhouse products far exceeds the supply during most seasons.

Inquiry is often made regarding danger of over supply of greenhouse products. This is a pertinent question, especially at such times as during the fall of 1912 and the fall of 1914, when lettuce sold for much less than it cost to produce it at the large forcing centers. In these two apparently dull seasons, many small towns throughout the country were not properly supplied with greenhouse products. During the past fall when lettuce sold for two and one-half cents a pound at Cleveland, it was bringing sixty cents a dozen bunches at many smaller towns. These facts will show at a glance that it is not a question of over-production, but rather a question of proper distribution of the products.

Another factor to consider with respect to avoiding the danger of gluts on our large markets, is diversification of crops. At the present time there are but three or four crops to which forcing men devote any very considerable attention. These crops, in order of their importance are: lettuce, cucumber, tomato, and radish. Lettuce is grown by nearly all forcing men in fall and winter, when there is least demand for it. As a result, lettuce often brings a low price at this time of the year, especially if the preceding outdoor growing season was a long one. Many other crops could be grown in fall in a small way, which would pay much better returns than does lettuce. Some of these crops are: rhubarb, witloof chicory, cauliflower, onions, beets and Swiss chard. By growing a greater diversity of crops, a double gain is secured. First, a direct gain from the sale of these additional crops; and secondly, an indirect gain, by lessening the production of lettuce in fall, and so increasing its value.

There is but one factor which seriously hampers the vegetable forcing industry, and that is "hard times." The industrial classes suffer most during periods of financial depression, and it is this class to which the greenhouse man looks for an outlet of his produce.

In addition to making use of the greenhouse for growing vegetable plants to maturity, it can be used in spring of the year for growing early plants to be set out in the field. This will require the greenhouse space from about the first of February to the first part of May. Early vegetable plants may be grown not only for the owner's use, but also for sale. This is a very profitable business near many towns. After the greenhouse has served its purpose for plant growing, cucumbers can be set out the beginning of May and yield a handsome return throughout June, July and August.

MOST IMPORTANT SECTIONS

The largest vegetable forcing section of New York State is located near Rochester, Monroe county, and is known as the Irondequoit section. This is one of the seven large forcing sections of the United States. A careful estimate of the area under glass at this place would place it at about twenty-five or thirty acres. There are no very large greenhouses, but many gardeners have small ranges. The largest range consists of about eight acres. This is of the ridge and furrow type construction. Most of the houses in the Irondequoit section are of the even span, separate type. They are of the very best and most expensive construction. The 40 x 180 foot all iron house seems to be the popular type, and several of these houses have been erected during the past year.

The Irondequoit section not only supplies Rochester with win-

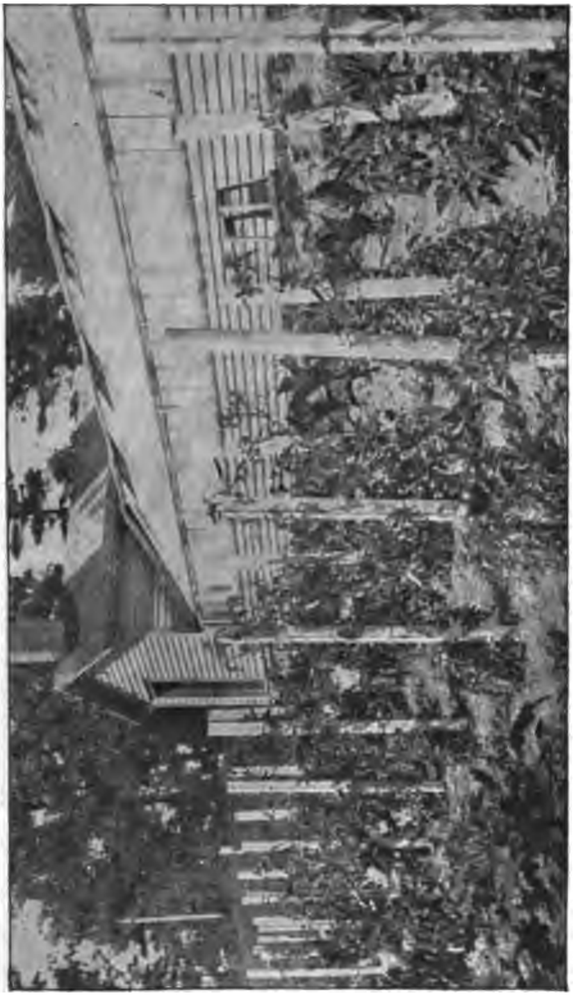

FIG. 365.—THE TYPE OF GREENHOUSE WITH WHICH GARDENERS BEGIN VEGETABLE FORCING

ter vegetables but ships a great deal to Buffalo and the smaller towns of the state, as well as to the mining towns of northern Pennsylvania. Many small towns in New York State offer splendid inducements in the vegetable forcing business. A few towns, such as Binghamton, Elmira, Troy and Ithaca, have one or more small vegetable ranges, and the men conducting these places are doing a splendid business. There are many other towns in the state which at present are under-supplied and which offer just as good opportunities as the towns mentioned.

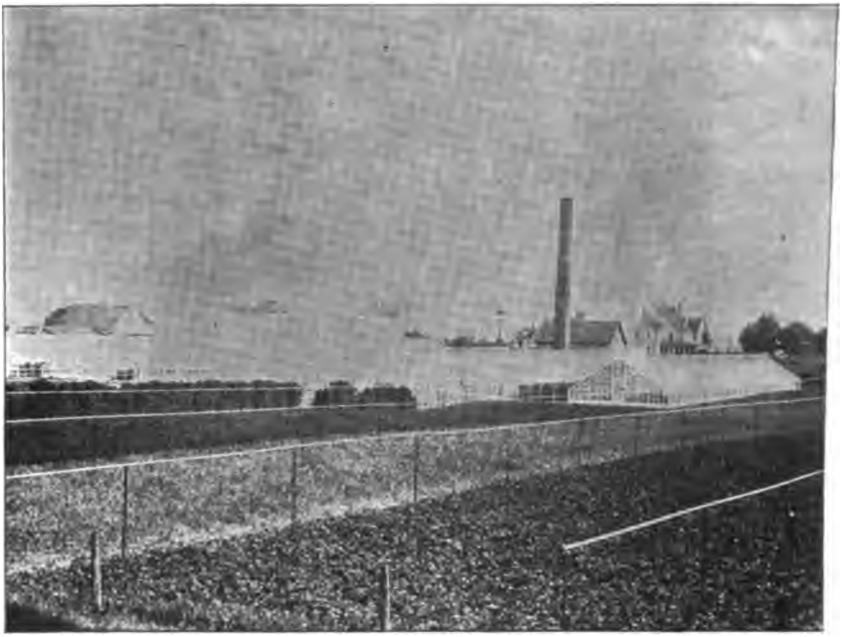

FIG. 366.— A ONE-ACRE RANGE AT IRONDEQUOIT

SOIL

The soil in the Irondequoit section is one ideally suited for vegetable forcing. It is a light sandy loam, which will take plant food and water readily, but the surface of which will dry off quickly. It is very easy to work and does not bake or puddle.

FERTILITY

Growers maintain the fertility of their soil by trenching well-rotted manure several times a year. This well-rotted manure not

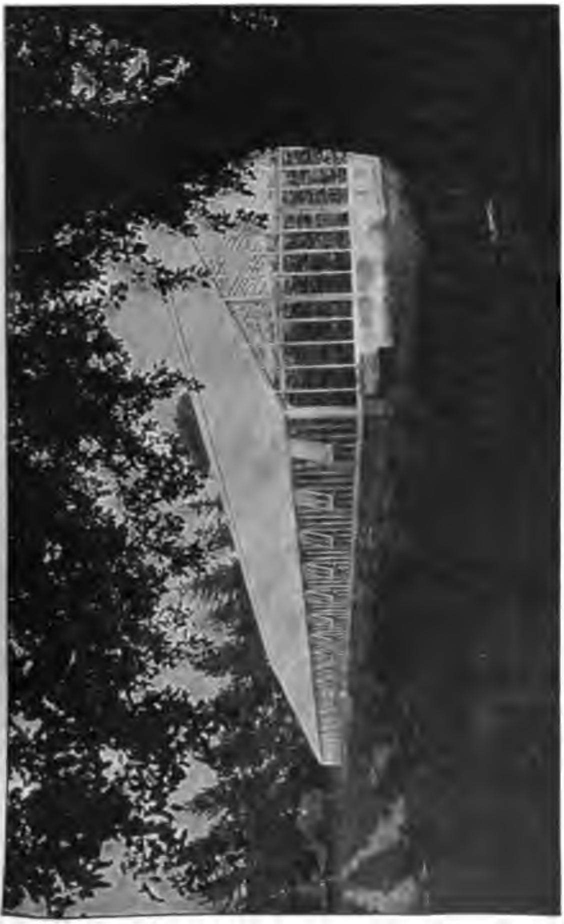

FIG. 367.— A MODERN VEGETABLE HOUSE

only adds plant food to the soil in a readily available form but also improves its physical condition.

Not many growers of greenhouse crops use commercial fertilizers, most of them holding the opinion that by trenching manure enough plant food is added to the soil to maintain fertility. Probably commercial fertilizers would prove beneficial, especially for certain crops. Some form of phosphorus would be very beneficial to cucumbers and would hasten the maturity of the fruit. Potash should be applied to tomatoes, since it is known that the tomato plant demands large amounts of potash, and a sandy soil usually is low in this element of plant food.

LIME

Greenhouse men lime their soils every year, applying at the rate of five to eight pounds of air-slaked lime to every one hundred square feet of area. Lime improves the physical condition of soil and sweetens it.

GENERAL CROPPING PLAN

During the past few years, many of the Irondequoit growers have attempted to raise cucumbers and tomatoes as well as lettuce, radishes and parsley, in their greenhouses in fall. In many cases these growers have failed with their fall crops of cucumbers and tomatoes, chiefly because the houses were neglected in fall, most of the growers devoting their time to celery harvesting instead of remaining in the greenhouses. Cucumbers and tomatoes need constant care and attention. Especially is this true in the fall of the year. One grower near Elmira, N. Y., has been very successful with fall tomatoes, and the secret of his success is constant and unceasing care and attention to the plants. It is practically an impossibility to raise cucumbers successfully in the greenhouses of New York State in the fall of the year on account of the dark, gloomy weather prevailing in at least most sections of the state at this time. Under proper care and management, tomatoes can be successfully grown in this state in fall, but they will need a great deal more attention than in spring, and one cannot expect nearly so large a crop, but prices are usually better in fall than in spring.

The one important factor to be kept in mind with fall tomatoes is to get an early start and have all the fruit set before the period of dark, gloomy weather. This will necessitate sowing the seed the latter part of June in order to have the plants ready for the beds the latter part of August. These plants should give a good crop of mature fruit for the Thanksgiving and Christmas markets.

The usual cropping plan followed by most growers in New York State is lettuce and radishes in fall and winter. In spring the houses are given over to tomatoes and cucumbers, most men sacrificing an extra crop of lettuce in spring for an early crop of cucumbers or tomatoes.

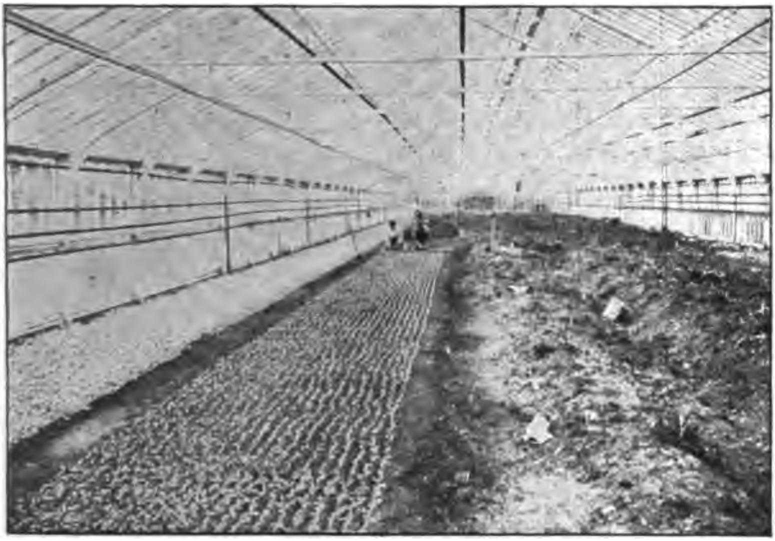

FIG. 368.— PLANTING LETTUCE IN A LARGE COMMERCIAL HOUSE

LETTUCE

There are two types of lettuce grown at Irondequoit, the leaf or bunching type and the Grand Rapids variety of this type. A loose head type is grown for local market, the variety being known as May King or Improved Keene. The Grand Rapids lettuce is shipped to smaller towns of the state and to the mining districts in northern Pennsylvania. The growers in smaller towns grow the Grand Rapids variety almost entirely.

The seed is sown in drills in the ground beds at one end of the house. In from two to three weeks the seedlings are pricked out and placed in another portion of the bed, spaced 2 x 2 inches. After growing here for about three or four weeks, they are set in the permanent bed. The spacing in the permanent bed varies with different growers, some spacing 7 x 7 inches, others 6 x 7 inches, and still others 6 x 6 inches. The 7 x 7 inches spacing is used most extensively with the May King variety.

In early fall and spring it takes about six weeks to mature a crop of lettuce after it is placed in the bed. In late fall and winter it requires eight or nine weeks.

The growers in New York State sell nearly all their lettuce by the dozen heads, not by weight. Lettuce sold locally at Rochester brings twenty cents a dozen heads in fall, until in December, when it brings twenty-five cents a dozen for the remainder of the season. In smaller towns in the state the growers receive from twenty to thirty-five cents a dozen heads.

No standard type of package is used to market lettuce, as most of it is sold locally. For shipping, the growers use various types of cheaply constructed packages, some merely using old orange crates, which are purchased very cheaply.

CUCUMBERS

At Rochester the Abundance variety of cucumber is grown almost exclusively. It is a cross between the English type and the American type, and the growers have selected for a cucumber twelve inches long and about two and a half inches in diameter. This cross cucumber is also grown in smaller towns in the state, but the White Spine is grown to a greater extent away from Rochester.

The seed is sown in flats, in drills about one and a half inches apart and about one inch between seed in the drill. As soon as the cotyledons have developed, the seedlings are pricked out into three-inch clay pots. From these they go to four- or five-inch pots, depending upon the length of time they are to be held before going to the permanent bed. It is always well to imbed the clay pots in soil so as to prevent drying out. The young plants are grown at a temperature of 70 degrees. Great care is exercised so as to avoid checking the plants at any time, since the cucumber plant never recovers from a check.

Cucumbers are grown chiefly as a spring crop in New York State. The Rochester growers sow the seed for their first crop on the first of January. These plants go to the beds in early March and start bearing mature fruit the early part of April.

In New York State all growers with large houses train their cucumbers on the overhead trellis system. It has been found that with the Abundance variety of cucumber, a much higher yield can be secured by this method of training than with the upright system, although the plants do not come into bearing as early.

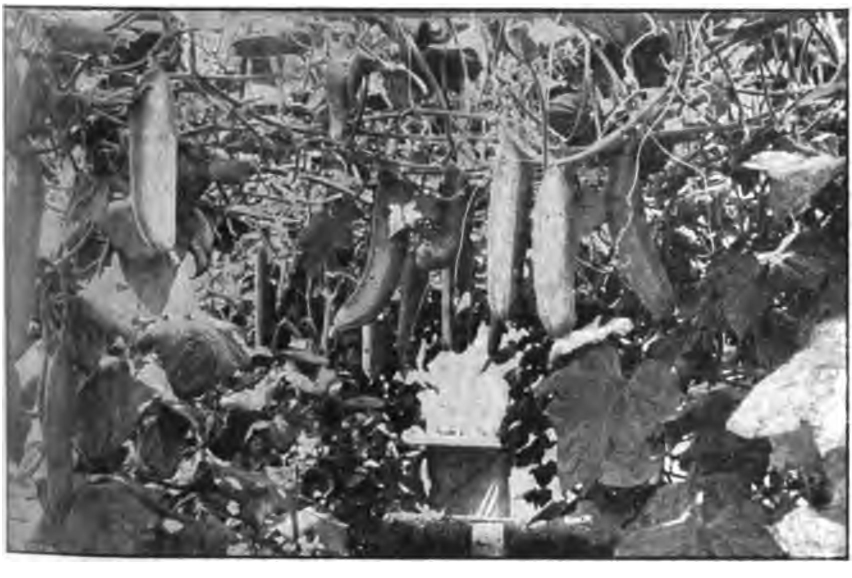

FIG. 369.—CUCUMBERS TRAINED ON AN OVERHEAD TRELLIS.

With this system, each plant is given at least sixteen square feet. The plants are taken to the overhead trellis by means of a cord looped around the base of the plant, and tied to the top wire. All the side-shoots or laterals are removed as soon as they develop. As a rule, all the female flowers are also removed. As the plant nears the overhead trellis, three or four laterals are left to develop and these form the starting point for other laterals and sublaterals which will finally cover the trellis. As the leaves on the main stem or on the trellis turn yellow, they are removed. The new shoots developing on the wires are pinched off just beyond the second node.

During the past season two troubles have materially lowered the yield of greenhouse cucumbers in New York State. Namatodes or eel-worms were very severe in many houses. The growers have not practiced systematic sterilization, but nearly all of them steam sterilized their soils in the fall. The other trouble which has caused a great deal of loss is a new disease known as white pickle. This new trouble has shown up especially in the Irondequoit district. The effects are first found upon the fruit, it turning a lighter green color. Often the fruit becomes blotched in appearance, which blotches sometimes show as warts. Both small and large fruits are attacked. Later the leaves turn yellow and die. This disease seems to be more prevalent with fall than with spring cucumbers. As yet, nothing is known as to the cause of this trouble, although it is thought to be contagious. Therefore, the plants should be removed from the house as soon as they become affected.

Red spider, white fly and aphides have been very severe in many cucumber houses. For red spiders the growers syringe the undersides of the leaves with a strong current of cold water. For white fly they fumigate with hydrocyanic gas at the rate of one ounce potassium cyanide to four thousand cubic feet, and nicoticide fumes efficiently control the aphis or green fly.

The fruit is picked regularly every morning and marketed locally. The earliest cucumbers in spring bring two dollars a dozen. The price gradually goes down to a dollar or ninety cents per dozen in May and June.

Rochester growers figure on a yield of thirty-seven dozen cucumbers per hundred square feet of area as a good average. Many of the men secure better yields than this.

TOMATOES

New York State markets demand a red tomato. The Bonny Best and the Peerless or Lord Roberts are the two varieties most extensively grown. Some men have much better success with one than with the other. The chief objection to the Bonny Best, brought up by men who are successful with the Peerless, is that

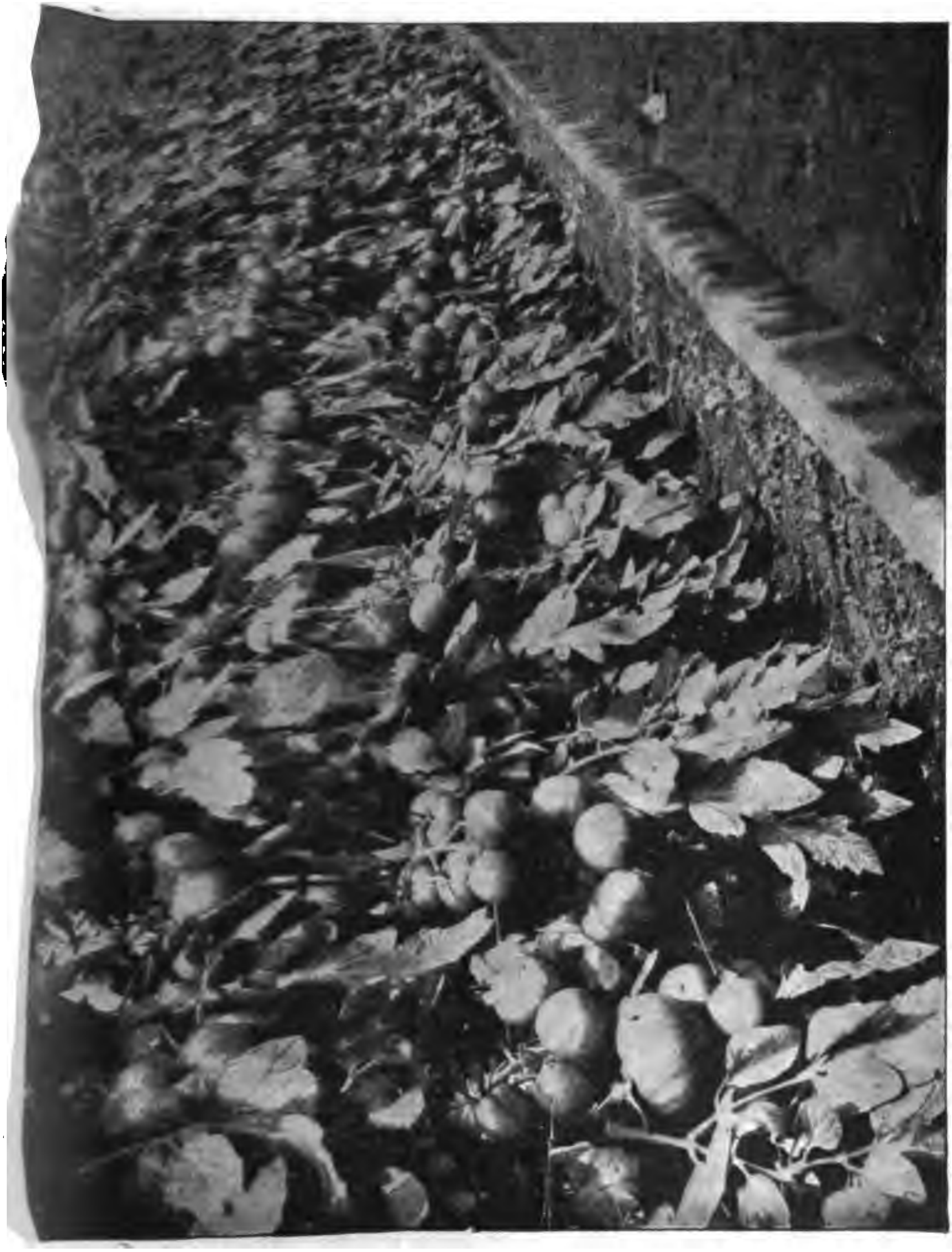

FIG. 370.— A GREENHOUSE CROP OF TOMATOES AT IRONDEQUOIT, N. Y.

it does not yield as heavily. The chief objection to the Peerless is that the fruit tends to be too small. With an English type of tomato like the Peerless, one must feed the plant heavily in order to get good-sized fruit, and the fruit clusters must be thinned to six or seven fruits.

The tomato plants are started in practically the same way as the cucumber plants, with the exception that the seed is sown more thickly in the drill. Also, the seedlings are usually pricked out two by two inches in other plats before going to three- or four-inch clay pots. It requires from ten to twelve weeks from time of sowing seed to time for the plants to be placed in the permanent bed, and about two months more for the plant to bear mature fruit.

The spacing distances vary greatly, most men allowing about four or five square feet to a plant. The single stem system of training is practiced almost entirely, all side shoots or laterals being pinched off as soon as they appear.

The disease which is giving most trouble with tomatoes is the leaf mold or leaf blight, caused by a fungus, *Cladosporium fulvum*. This fungus works on the lower leaves of the plants first, producing dirty, grayish-brown, moldy or velvety spots on the undersides. Yellow spots appear on the upper sides of the leaves. Later, the entire leaf turns black, shrivels and dies. If this disease does not appear until the crop is half gathered, it will do little harm. If it occurs early, the lower foliage should be sprayed with bordeaux mixture 4-4-50. A few men in the state were able to check this disease in their tomato houses this past fall by spraying early enough.

The fruit is harvested when it matures and most of it is marketed locally, although during the fall, growers who are successful ship to New York city and Philadelphia.

The yields and returns vary greatly with different growers. One grower using the Peerless variety secures an average yield in spring of ten pounds per plant, or a little over five tons to a house 180 by 30 feet. This is exceptionally high. Most growers do not average more than five or six pounds of fruit per plant.

In spring tomatoes usually sell for from ten to fifteen cents a pound, sometimes going as high as twenty cents in very early spring. In late fall they command higher prices.

PARSLEY

Most growers set out a small block of parsley in fall in the darkest portion of the house. Parsley will do well in such locations, and there seems to be a good demand for it on most New York markets.

The plants are grown in the open all summer and in fall the roots are brought to the greenhouse, setting them six by six inches in the beds. They require very little care, and growers get three or four cuttings from a bed during the winter. Parsley sells for from eight to fifteen cents a dozen bunches, usually about four sprigs to a bunch.

RADISHES

Radishes are grown extensively by some growers, especially by the Rochester men, in fall. The Scarlet Globe variety is used. The seed is sown in drills two or three inches apart, and the seedlings are thinned early to stand two inches apart in the row. The great trouble with over 50 per cent. of growers is that they do not thin their radishes enough, and as a result the plants produce all tops and very small bottoms.

The radishes are bunched, placing six or eight to a bunch, depending upon the size of the roots and the market demand. They bring from twenty to thirty-five cents a dozen bunches throughout the winter months.

WATER CRESS AND ONIONS

Two other crops grown in a very small way at Rochester in fall are water cress and onions. The seed of water cress is usually sown broadcast in September. Some growers transplant the cress in three or four weeks, setting it six by six inches. It is claimed that transplanting gives better, stockier plants. Cress is marketed in bunches about one and a half inches in diameter, and sells for thirty to forty cents a dozen bunches. It requires little care, and is a very profitable crop, provided a good market is available.

The Egyptian or perennial onion is used for forcing. After the sets have been removed from the onion stalks in the field in early fall, the so-called leaves are cut off close to the ground. New shoots are sent up, and the old bulb splits, forming perhaps six or seven new bulbs. Just before frost, these bulbs are removed to pits, and are frozen. When ready to use, they are thawed out gradually, and then set close together in out-of- the-way places in the greenhouses. Nice green onions the size of a lead pencil will be produced in from one to three weeks, depending upon the amount of sunshine. Four or five onions are placed in a bunch, and they bring from twenty to twenty-five cents a dozen bunches. Many growers in this way secure good returns from dark corners which would otherwise be waste space.

ESSENTIALS TO SUCCESS

Success in vegetable forcing depends upon three factors. First, a love of the work. There is no field of plant industry in which one is brought into closer contact with plants. If a person does not care to work with plants and be with them constantly, he had better not undertake vegetable forcing. Second, the selection of a proper location, with respect to water supply, fuel supply, market and transportation facilities. The third factor upon which success depends is attention to minute details. In common with floriculture, vegetable forcing is the most intensive of agricultural pursuits. All conditions of production are under the operator's direct control. If a grower allows one condition to vary slightly, he will usually allow others to vary. The sum total of these apparently insignificant variations may easily mean failure.

To a man who is imbued with a deep love for growing plants, who has selected a suitable location, and who is willing to make sacrifices in order to have all conditions ideal for the growth of the plants, vegetable forcing offers rich rewards.

THE FARM GARDEN

William Hotaling, Kinderhook, N. Y.

Farmers' Institute Lecturer

The farm garden is often one in name only. If properly managed it should be one of the most profitable parts of every farm, and the factors that mean success are: suitable soil, convenient location, thorough preparation, proper varieties, good seed, economy of labor, doing the work at the right time and in the right way, and having something to use as much of the year as possible.

The laying out of the garden is important. The longer and straighter the rows the greater will be the economy of labor, and in practically every part of the state it will pay to plant far enough apart so the ground may be worked with a horse.

Fig. 371.— String Beans and Carrots From the Home Garden

A LIST OF DESIRABLE VARIETIES

Spinach would naturally be the first vegetable to use in spring, and wherever the climate will allow should be sown in August or September (depending upon latitude), in order that it may get two or three inches high by winter, then covered with coarse straw or litter for protection. This cover is removed in the spring when danger of frost is passed, and the spinach is quickly ready for use. For later use sow as soon as the ground can be worked in spring and about every six weeks for succession.

The onion may be treated the same as spinach, using either the sets in late fall or the seeds sown in time to grow them to about set size. Either will give much earlier onions for use than we can get if the ground is not prepared until spring and setting done then. The sets are more expensive but much less work, and are therefore to be recommended.

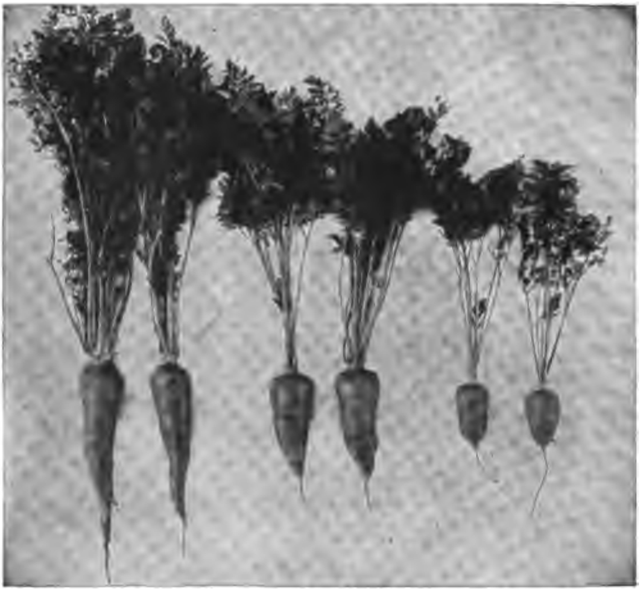

FIG. 372.— CARROTS OF THREE TYPES. THE SHORT TYPE IS USUALLY GROWN FOR EARLY USE, AND THE LARGER TYPES FOR WINTER

Seed onions and all root crops, especially for early use, do better as a rule if put in reasonably early in spring.

Parsnips and parsley germinate very slowly and should not be covered deeply, especially if the ground is dry. In that case place a board or a damp sack over the rows for a few days after planting.

Parsnips are best stored for winter by piling like stove wood on a board, sprinkling on enough earth to fill openings, then setting where they will stay frozen. To draw out the frost, when ready to use, break off and put in cold water. They may be left in the ground until spring, if desired.

Carrots too, while they germinate more quickly, are rather delicate when first up, yet it is important that all should be worked quickly to keep down weed growth and conserve moisture.

A few radish seeds mixed with all these, and any others that may be delicate when first up or that come up slowly, are a help. Then mark the row quickly and plainly so that work may be started at once, as well as breaking the soil so that the less vigorous seeds may more readily push through.

Beets may be sown as soon as the ground is fit in the spring. For winter use, either for canning or storing, sow about July first.

With all the root crops and onions it seems unnecessary to say anything about varieties, there being little differences except size and shape. All, however, are considered laborious to grow; therefore care is important. Cultivation should be begun as soon as possible and the rows kept narrow — the narrower the better. When plants are two or three inches high, pass through with a hoe, cutting out the row except where the plants are to stand, leaving in each place a clump about one to two inches long. Then one can quickly thin by hand to the desired stand. Generally they should be gone over twice, leaving at first about double what is eventually needed to insure a full stand. This makes the ground clean and easy to work.

Lettuce is another vegetable one should have, and there are many good varieties; generally, however, all are of two rather distinct types — the loose open head or the compact cabbage head. It is natural for all to head in one of these two ways if properly handled. Lettuce should be sown rather thickly in rows, keeping them always thinned so that they do not touch each other; or the seed can be sown in the seed bed and transplanted to about four inches apart. Lettuce is one of the things that must grow quickly to be good. The soil should be enriched with well-rotted stable manure or some other form of quickly available nitrogen. It is also a plant that, while it naturally roots deeply, can not do so in hard soil. Therefore, the ground should be prepared well and deeply for best results.

If an open head variety is desired, Simpson Black-Seeded is a good one. If the true head is preferred, Hanson's head lettuce will generally be satisfactory.

Peas are almost endless in variety. They are distinctly a cold weather plant, therefore anything we can do to keep the root system cool and moist is desirable. This can generally best be done by planting in rather deep furrows, covering lightly at first and drawing in earth as the crop is worked, until the surface is level. Peas do best when fertilized more heavily with phosphate and potash, rather than with nitrogen. The best single fertilizer I have ever used in gardens is wood ashes mixed with the soil and spread thickly in the rows.

Smooth peas are hardiest and should be planted first. Alaska, Premium Gem and Dwarf Champion will generally be satisfactory. Nott's Excelsior and Telephone are also excellent. None of these require bushing and can be obtained everywhere. Planted at the same time they give good succession. The Dwarf Champion planted as soon as last planting of the above is two or three inches high, will continue the succession as long as practical. Planting at alternating distances of one foot and three feet so that two rows may be pushed together when large enough, helps them to stand up.

For early tomatoes, and in places where the season is short, Earliana should be used. For later and longer seasons, Stone is a good variety.

Tomatoes are more often unsatisfactory because of shallow planting than for any other reason; no matter what their size they should be set deeply. Their ability to send out roots along the entire stem quickly gives them a strong root system.

Where plants can not be bought they can generally be raised in pots in the house for early planting and should be as large as possible and have some small fruits by the time they are transplanted in the garden. Set not less than four feet distant in the rows, rows five feet apart. They should be set so that not more than four or five inches extend above the surface.

Another very injurious thing to the tomato plant is cold winds. This may largely be overcome by setting plants east and west, and nailing together two ten-inch boards like a common eave trough, laying this in the north side of the row, one board lying flat, the other standing upright. A few stones may be placed so as to keep the boards from blowing over on the plants. This allows the sun to strike them all day and not the wind. At night, turned upside down over the row, they are much better than boxes and cans. If the green tomatoes are picked off the last thing before frost, wrapped in paper and stored in baskets or flat boxes (not too many together) in a cool, dry place, most of them ripen as good as southern stock seen in the stores.

Muskmelons too are not grown as generally as they should be. Small early varieties like the Jenny Lind may be grown successfully quite far north.

In the growing of any of the melons and cucumbers a little scheme used by and learned from a southern grower for early use has been most valuable.* Throw up a ridge about a foot high running east and west, then at a distance of from three to four feet make openings on the south side from the edge. This will be from very shallow at the edge to quite deep at the back of opening. Then take one-half of the seed and soak in tepid water for twenty-four hours, or long enough to start the sprout; mix with dry seed and plant from the edge of opening into back of same and cover. One will then have sprouted seed and that

FIG. 373.— HARVESTING SNAP BEANS

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* See article on "Melons" by Charles D. Barton.

which is not, and covered all the way from one-quarter of an inch up. The result is, some will be up under good conditions in forty-eight hours and others will continue to come up for three weeks. After a couple are up the others should be kept pulled out. The advantage of this plan is: if the first plants are lost by frost there will probably be others to take their place the next day. All will appreciate the difference in temperature on the protected south side of the ridge.

For pickling, plant cucumbers July 1.

Lima beans may be grown successfully in most parts of the state. The small bush lima is very prolific and about as hardy as any of our bush beans, with good length of season. There is no longer need for using the pole varieties.

With the large limas we should bear in mind that all must turn upon edge before they can come up. Many times, because of their size or soil condition, they are unable to do so; as a result of which they necessarily rot. Then we think the seed has not been good. The easiest way to overcome this is to stick with the eye down when planting. Both Henderson and Burpee are good and may be had everywhere.

Among the varieties of other beans the Golden Wax and Early Valentine are good bush varieties and Lazy Wife is a good pole variety.

It would hardly do to say anything about a garden without including corn. The Golden Bantam, Champion, Country Gentleman and Stowells' Evergreen will give a nice succession of true sweet corn.

While celery does not need to be set early, the plant must be started early. The seed bed, like all other seed beds, should not be too rich or plants are liable to damp off if weather is dry. The bed must be watered and partially shaded to prevent baking. A slat cover where shade and sun alternates is best.

Golden Self Blanching and White Plume are standard varieties.

The plant food must be where the roots can get it. Therefore, if we trench (which for a garden is best) we must put plant food under the plants. Boards, building paper or roofing paper are good for blanching and are cheaper and easier than to use earth. If earth is used, plants should be carefully handled to avoid getting more earth than is necessary inside; and if it is necessary to water after starting it to blanch or after it is stored, care should be taken to get water only on the roots, as water inside the head will promote decay. To water, use a piece of pipe or hose and funnel to avoid getting water on tops. A wet root system and a dry top is ideal.

To store celery for winter put earth only on roots.

Cauliflower requires the same treatment as cabbage, and for best results the crop must be put in about July 1 so as to mature after hot weather. The leaves must be either broken over or tied together to protect heads after heading. Early Snowball is a good early variety; Large Algiers a good late one.

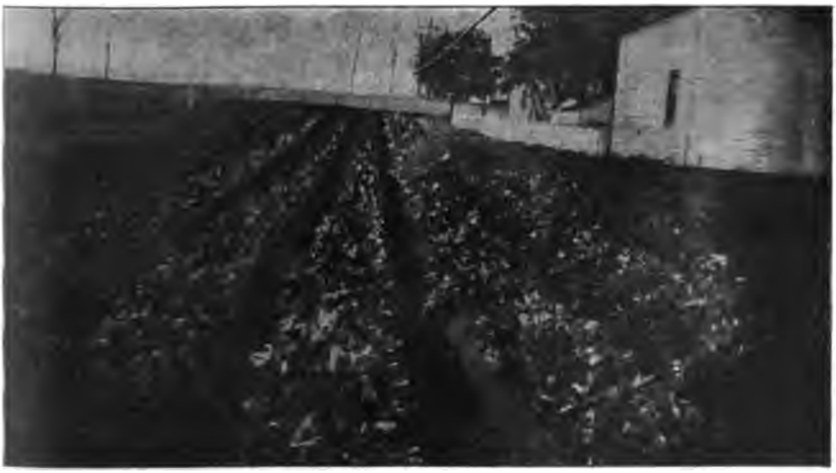

FIG. 374.— CELERY BLANCHED BY MEANS OF BOARDS, FLUSHING, L. I.

Egg plant is very tender and requires about the same treatment as the tomato. At the start it must be carefully watched to prevent injury from potato beetles. Black Beauty is a good variety.

Okra is a southern vegetable but excellent to use in connection with tomatoes, or in soup. It should not be planted until the ground is warm, in rows 2½ feet apart and 1½ feet apart in the row. White Velvet is a good variety. Use pods when young and tender; cut up as string beans.

Peppers will never do well if put out before weather and ground are warm. They grow rapidly and are ready to use in a comparatively short time after planting, if warm conditions prevail, but they require lots of heat to develop quickly. Chinese Giant is the best variety.

Salsify, or Vegetable Oyster, is used as a substitute for oysters, tastes as good and is more nutritious. Sow early in spring, thin to 3 inches in the row, dig in the fall and store as beets; or it may be left in the ground all winter and used in the spring. Mammoth Sandwich Island is the best variety.

Rhubarb, or pie plant, with asparagus, demands a permanent place in every garden, furnishing material for delicious pies or sauce long before berries or fruit are obtainable. It is very hardy and requires no winter protection, although vigor and earliness are enhanced by covering during the winter with coarse manure.

It may be grown from seed sown in early spring, as with onions. Later the plants should be thinned to six or eight inches in the row. The next spring the yearling roots should be set as early as possible, in rows four feet apart and an equal distance in the row, with the crown of the plants level or slightly below the surface of the ground. Or, roots may be purchased and a year's time saved.

Rhubarb is a rank feeder and the soil should be full of humus, supplemented annually by liberal dressings of manure. The more thorough the tillage, the more satisfactory will be the crop. No crops should be gathered until the third year after planting, in order that a strong root growth may be established. Only the larger stalks should be pulled, leaving the others to assist in maintaining the plant. Seeds should be removed promptly as they exhaust the plant.

After rhubarb has been out a long time the stalks are apt to be small. When this occurs the roots should be cut out and thrown away. They are not as desirable for starting a new plantation as young, vigorous plants.

If this cutting out is done in the late fall, and the roots taken out are allowed to freeze, and are then planted in boxes in the cellar, they will start to grow; and one may have the white tender stalks to use during the winter.

Turnips have value both for the table and for feeding stock. For summer use I would advise growing kohlrabi, which, strictly speaking, is not a turnip. The seed can be sown in the hotbed, or, as soon as the ground is fit, in the open, in rows 14 inches apart and about 4 inches distant in the row. Transplant about the same time as early cabbage. They should be gathered before they are full size.

The common strap-leaf purple turnip can be sown between the rows at the last cultivation of corn or potatoes, and in a wet season will make a good crop either in the garden or field. They can be sown the last of July after the early peas have been gathered.

Rutabagas in New York State should be sown in late May or early June, in drills 18 inches apart in the garden and in the field far enough apart to work with a horse. After they are established they should be thinned to 8 or 10 inches in the row. Rutabagas grow best when the nights are cool.

I have left asparagus until last, not because I consider it of less importance, but because I want to take it up a little more fully. There is nothing I can think of as being a greater acquisition to the average garden than a good asparagus bed, and it takes but a comparatively small one to furnish an ample supply for the average family. One hundred plants set 18 inches apart in the row — and if more than one row, 4 feet apart — should be ample. The Palmetto is an excellent variety. If the bed is to be plowed over plants should be set 12 inches deep.

Again we must have plant food under the plants for best success. A trench eighteen or twenty inches wide with two or three inches of well-rotted manure well trodden down, and three inches of good soil on that, is ideal. Cover plants only two or three inches at time of setting and work earth in during the summer, having all level by fall. After that cut tops when killed by frost and burn, give light dressing of manure to work in in spring and keep free from weeds. The second year some may be cut and the third year a full crop. The bed will remain for many years. This is satisfactory garden treatment.

VALUABLE TOOLS

Where there are not too many stones, a plank drag is excellent, and, alternated with a spike-tooth harrow, will do away with much raking. When the ground is comparatively free from stone, the combined wheel hoe and seeder is a great labor saver. Where this is not practical the implement made by putting five small cultivator teeth on a handle like a hoe, and that are adjustable, is almost indispensable. By drawing it either each side or between the rows, much work can be done.

SOILS AND FERTILIZERS FOR VEGETABLES

J. F. Barker

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Soils to be well suited to the growing of vegetables should be light in texture, thoroughly underdrained, but well supplied with moisture. This usually means deep sandy loams, loams and muck soils. The physical properties of the soil and nearness to market are more important factors to be considered than natural fertility, for the latter can be supplied more easily than the first can be modified. The necessity for frequent stirring, ridging and even handling of the soil in vegetable growing constitutes in itself sufficient reason why soils of light texture should be selected. But where early and rapid growth and quick maturity are important considerations, it is only the light, sandy or muck soils that can be used. Such soils warm up much earlier in the spring, admit of more rapid decomposition of organic matter and formation of nitrates and more rapid movement of plant-food solutions in the soil. These crops, on such soils, can be planted earlier in the spring and brought to maturity in a shorter time than on heavier types of soil. However, almost any soil can be made to grow a good crop of vegetables, and for home use any type of soil available may be so employed. The sandy soils will not produce so large a crop as somewhat heavier soils under the same conditions, and so for late vegetables the loams or even silt loams are to be preferred.

FERTILIZERS AND MANURES

The liberal use of fertilizers nearly always plays an important part in vegetable growing. There is almost no soil naturally so well stocked with fertility that it can be very long cropped intensively, and with greatest profit, without the use of fertilizers.

Furthermore, on account of location and ability to produce early crops, soils of low natural fertility are often the ones best adapted to trucking purposes. Principles regarding the maintenance of fertility in connection with vegetable growing are not radically different from those applicable in general farming; but considerations of earliness, quality and price of crop, together with peculiarities of soil, make necessary the more extended and special use of fertilizers. The maintenance of organic matter is here as everywhere of prime importance, and the use of any amount of high-priced easily soluble plant food will not make up for a lack of it. If chemical fertilizers alone are depended upon, the tendency is for it to require more and more of them each year to produce the same results, and a condition may soon be reached where their cost will equal or exceed the profit from their use.

The principles of crop rotation are also, from a fertility point of view, just as important in connection with vegetable growing as in general farming. It is much more difficult to maintain satisfactory yields when any one crop is grown continuously on the same land than if it is grown in a systematic rotation with other crops. However, special demands may sometimes make it advisable to sacrifice something in yield for the sake of specializing in a certain crop.

Manures and Green Manures

In the vicinities of cities stable manure is very largely depended upon to keep up fertility. Where this can be had in liberal amounts no chemicals may be needed and no other provisions made for keeping up organic matter. Yet very often a phosphorus fertilizer will be profitable in addition to manure and will help produce a better quality of crop and earlier maturity. Where manure is used only in moderate quantities phosphorus should always be used with it at the rate of 300 to 1000 pounds per acre of acid phosphate. On muck soils some potash will be needed in addition, and with market-garden crops on any soil both nitrogen and potash may be needed as mentioned later on. The use of manure can be overdone on some crops, such as potatoes, and in other cases it may induce too much vegetable growth or late maturity. The remedy, then, is less manure and more phosphoric acid and potash; but with the scarcity of manure its too liberal use is perhaps not frequent. In intense cropping where two or three crops are grown on the same land in one season, 20 to 40 tons per acre per year would not be considered excessive.

Green manures.— The use of green-manure crops is applicable where vegetables are grown on an extensive scale. Vetch, rape, cow-peas, clover or some other quick-growing crop, preferably a legume, may be sown after the vegetable crop is off and plowed under late that fall or the following spring. Under so many different conditions of climate and cropping it is a local problem as to what arrangement of this kind can be made.

Commercial Fertilizers for Sandy and Loam Soils

In planning commercial fertilizers for vegetable crops perhaps the three most important factors to consider are (1) the value of the crop per acre, (2) whether early market garden or staple truck crops are grown, (3) condition of soil, especially as regards organic matter. Variations in soil types commonly used for vegetables do not play such an important part in determining fertilization, excepting in extreme cases, as comparing muck with sandy and loam soils.

Nitrogen, phosphoric acid and potash are usually all three profitable in any fertilizer mixture for any kind of vegetable. The proportion in which they should be used will vary mainly with the kind of vegetable and amount of organic matter in the soil; and the total amount of fertilizer that can profitably be used will vary principally with the value of the crop per acre and with the condition of the soil.

Suppose that on a certain soil an application of twenty dollars' worth per acre of fertilizer will produce a 20 per cent. increase in yield of some crop. If this crop as fertilized has a market value of $75 per acre, the fertilizer application will have been made at a loss, and the amount of fertilizer might have to be cut down to five dollars' worth per acre before it would pay. On the other hand, if the crop should have a market value of say $300 per acre the heavy application of fertilizer would have been made at a good profit. There is reason to believe that in common practice the amount of fertilizers applied in vegetable growing is often too high for greatest net profit. In some experiments in potato growing on Long Island, conducted by the Geneva Experiment Station, it was found that 1000 pounds per acre of a complete fertilizer gave greater net profit than any heavier application when potatoes sold at 50 cents per bushel. And in some experiments with onion growing on muck soil near Florida, Orange county, it was found that the use of more than 1000 pounds per acre of 4-8-10 fertilizer was seldom as profitable as that amount, with onions at $1 per hundred pounds. But in the growing of market garden crops where earliness and quality are prime considerations and value per acre of the crop high, very liberal amounts of fertilizer are important. This applies to early beets, early tomatoes, early cabbage, early canteloupe, early sweet corn, asparagus, early turnips, cucumbers, early sweet potatoes and others. In these cases 10 to 15 tons per acre of manure may be applied in the fall, winter or early spring. At the time of preparing seed-bed there can be used 1000 to 2000 pounds per acre of a fertilizer high in phosphoric acid and potash, with perhaps some nitrogen in organic form, making a mixture of — say 2-8-10. At time of setting or planting use in addition 100 to 200 pounds per acre of nitrate of soda, and three or four weeks later another similar application. The nitrate of soda especially promotes rapid growth and improves quality; also increases the yield. For most crops it can be used to best advantage in the early stages of growth, and where a second application is made it should not be put off more than a few weeks from time of planting. A late application may delay maturity. In case of sweet corn a dressing of nitrate may be made when ears are beginning to form.

A general rule as regards fertilizers for general farm crops on the great majority of soils is that phosphorus is the first important element to be added in commercial form. If organic matter is used in fair amounts, nitrogen and potash need be purchased only in small quantities or can be done away with entirely. Organic matter furnishes nitrogen and helps to make available more potash from the large reserves of that element contained in most ordinary soils; but as the limitations of nitrogen and potassium are thus removed, the use of larger amounts of phosphorus becomes profitable. These same principles apply quite generally to the growing of vegetables as field crops on any but muck soils. In such cropping it is usually a large development of fruit, roots or tubers that is desired rather than a rapid succulent vegetable growth. Also the crop has a much longer time to grow than early garden crops and so can use more slowly available plant food. This applies to the growing of such crops as potatoes, onions, late cabbage, and tomatoes and other crops used for canning.

In case of early garden crops where large amounts of soluble fertilizers are needed, they can be used more profitably when the soil is well supplied with organic matter than otherwise. These quickly growing crops do not make very efficient use of the slowly available forms of plant food in the soil, and organic matter makes the soil more retentive of soluble nitrates and potash; making their use more profitable.

Fertilizers for muck soils

In this state muck land is used mainly for truck growing rather than market gardening, and fertilizer recommendations are made with that in mind. Where muck consists mainly of organic matter, as is usually the case, potash is the first important constituent of fertilizer to be used, and may be applied at the rate of 100 to 200 pounds per acre of muriate or sulphate, or 300 to 600 pounds of kainit. When potash is not available manure will take its place to some extent. Manure is always profitable on muck land, although it might at first be supposed that on account of the high nitrogen and organic matter content of muck this would not be the case. But the fresh decomposing organic matter of manure stimulates further decomposition of the muck and makes nitrogen available. Phosphorus is second in importance to potash on muck soils, but more necessary than additional nitrogen. Where commercial fertilizers alone are used on muck a mixture may consist somewhat as follows:

200 lbs.	nitrate of soda or dried blood
500 lbs.	acid phosphate
200 lbs.	muriate or sulphate of potash

The mixture will analyze approximately 3-8-10 and may be used at rate of 500 to 1500 pounds per acre, depending mainly upon acre value of the crop to be grown.

Lime for Vegetables

The importance of using lime to neutralize soil acidity in connection with vegetable growing has been pretty generally overlooked until the last few years. The majority of vegetables commonly grown are very sensitive to an acid soil and some of them — notably beets, spinach, muskmelons — can scarcely be grown with success unless a fair amount of lime carbonate is present. The following is a list of vegetables, all of which are known from actual field tests to give much better yields when the soil contains a fair amount of lime carbonate than when it is deficient in that material:

asparagus
beets
brussels sprouts
broccoli
cabbage
carrots
celery
chard
chicory
collards
cress
cucumbers
dandelion
egg plant
endive
horse radish
kale
kohlrabi
lettuce
lentils
muskmelon
onion
parsnip
peas
pumpkin
salsify
spinach
squash
sunflower
sweet corn
tomato
turnip

Many other vegetables may also be benefited by lime, but full data is not obtainable on the subject at present.

Objection has arisen to the use of lime on potato land since it, as any other material which tends to neutralize soil acidity, provides conditions more favorable to the development of potato scab. But potatoes are grown very successfully on land containing liberal amounts of lime, and the Rhode Island Experiment Station has shown that the use of lime on land that is acid will increase somewhat the yield of potatoes and particularly the percentage of large potatoes. Considering this and also that other crops particularly in need of lime will be grown in rotation with potatoes, it is doubtful if it is ever profitable to omit the liming of potato land that is acid simply to make it easier to combat potato scab.

A very large percentage of the sandy and loam soils in this state used for growing vegetables are deficient in lime and would be improved by a liberal application of that material in some form. The use of certain fertilizers, particularly ammonium sulphate, dried blood, fish scrap, acid phosphate and muriate and sulphate of potash tend to increase the acidity of the soil, and this may, in a few years, give rise to much trouble if lime is not present to counteract the acidity as formed; with the use of lime this tendency is of no consequence.

Muck soils in this state are seldom in need of liming. At least those underlaid with marl at no great depth are supplied with lime from this source sufficient to keep acids neutralized.

When land is in need of lime it is advisable to apply at least two tons per acre of ground limestone or its equivalent as an initial application, and one or two tons per acre may be added every three to five years thereafter. In some cases it may be advisable to make the first application two or three times as heavy.

Ground limestone (or carbonate of lime from some source) is the most desirable form of lime to use under the great majority of conditions. This is especially true in regard to sandy soils and in cases where liming is to be done only a short time previous to planting the crop. Instances are on record of temporary injury from use of caustic lime under these conditions.

It is well to apply lime to the rough surface of the ground after plowing and so let it be well mixed with the soil by the subsequent operations of preparing the seed bed.

GOOD SEED

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Of the several factors concerned in the production of vegetables, that of good seed is without doubt the most important, although it is one which frequently does not receive the attention it deserves. Too often if the seed has the general characteristics of the kind desired and is low in price, no further questions are asked — at least not until after it has been sown and it is too late to make a change. Meanwhile the vitality may have proved to be very weak, or, this point being satisfactory, subsequent observation may show that the variety is not the one desired, is badly mixed with other varieties; or the yield and character of the product is not satisfactory.

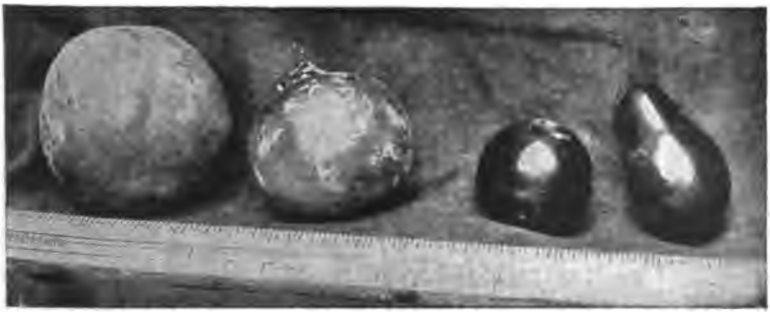


Fig. 375.— Result of Planting Unreliable Seed: Four Types of Tomatoes From the Same Packet

In most instances undesirable results of this kind could be eliminated had proper precautions been taken at the right time. In the first place it is unreasonable to expect a high-grade product at an unreasonably low price. It may happen that not always is the price charged and the quality of the commodity commensurate, but as a general principle there should be and usually is a considerable degree of parallelism between them. Furthermore, the sentiment produced by the attempt to purchase seeds at competition prices is not conducive to much improvement in strains.

At the present time we have no rule by which we can purchase seeds and be assured that they will give the results desired. The general seed catalogues published by the majority of the seedsmen, while fine examples of the printer's art, usually contain little of definite value to guide the prospective purchaser in the selection of the variety or strain he desires. Furthermore, almost every seedsman has a strain which he claims to be the best obtainable, and in some instances the seedsman does make an especial effort to keep his strains pure and true to type. Some of his seeds are grown under his personal supervision, while those grown by contract are in charge of men who have spent years in the business and take special care to keep the stocks pure. As a check on this work some seedsmen maintain trial grounds in order that they may acquire personal knowledge of the various stocks before they are disseminated among their customers. Other seedsmen may publish catalogues equally as attractive and make as strong claims concerning the merits of their strains, while as a matter of fact they may never have seen the stock from which it was produced or even know where or by whom grown, but simply have purchased the seed in bulk from a jobber, securing it at the lowest possible price.

Another practice far too common in the seed business is that of renaming varieties. In a test of cabbage conducted by the writer last year, the variety Jersey Wakefield, which has been on the market since about 1840, was grown under the name of Early Pointed, Earliest, Standard Early and New Greenpack. In each case the seed was purchased a few months previous to the time it was sown and was thought to be a distinct variety.

In view of the uncertainty concerning the purchase of seeds, it should need little argument to show the importance of making a preliminary test to determine the relative merits of the variety or strain previous to the time it is expected to be used for the general planting. In order to make this test of value, seed of the same variety should be secured from different sources, having enough from each to make the general planting the following year in case it proved satisfactory. Having secured the seed, a germination test should be made of each to determine its value in this respect as well as to obtain an index to the rate of sowing. This germination test will probably show some variations within strains, while the vigor of the seedlings will also probably vary as may be seen by Fig. 376.

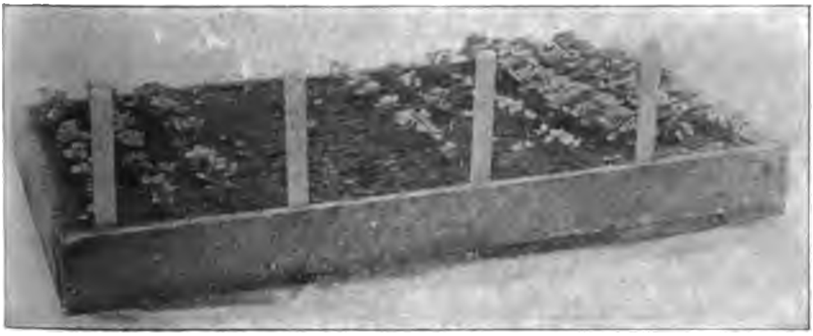


FIG. 376.—VARIATION IN GERMINATION OF JERSEY WAKEFIELD CABBAGE SEED

When the field planting is made, fifty plants will be sufficient. As they approach maturity, a study of the respective strains will show differences regarding general type, time of maturity, solidity of head and general productiveness. In order to secure accurate data, weighings should be made of the heads of the respective strains. The following table shows the variability of six strains of Jersey Wakefield cabbage grown the past season, each of which was purchased from a seedsman of good reputation.

Rec No.	Date planted	Yield per acre to 7/1	Total Yield per acre	Average weight of heads
Strain 1.....	May 5	2.33 tons	8.00 tons	1.65 lbs.
Strain 2.....	May 5	3.17 tons	7.00 tons	1.45 lbs.
Strain 3.....	May 5	3.17 tons	7.50 tons	1.50 lbs.
Strain 4.....	May 5	0.33 tons	8.00 tons	1.70 lbs.
Strain 5.....	May 5	5.00 tons	7.34 tons	1.60 lbs.
Strain 6.....	......	5.00 tons	8.34 tons	1.70 lbs.

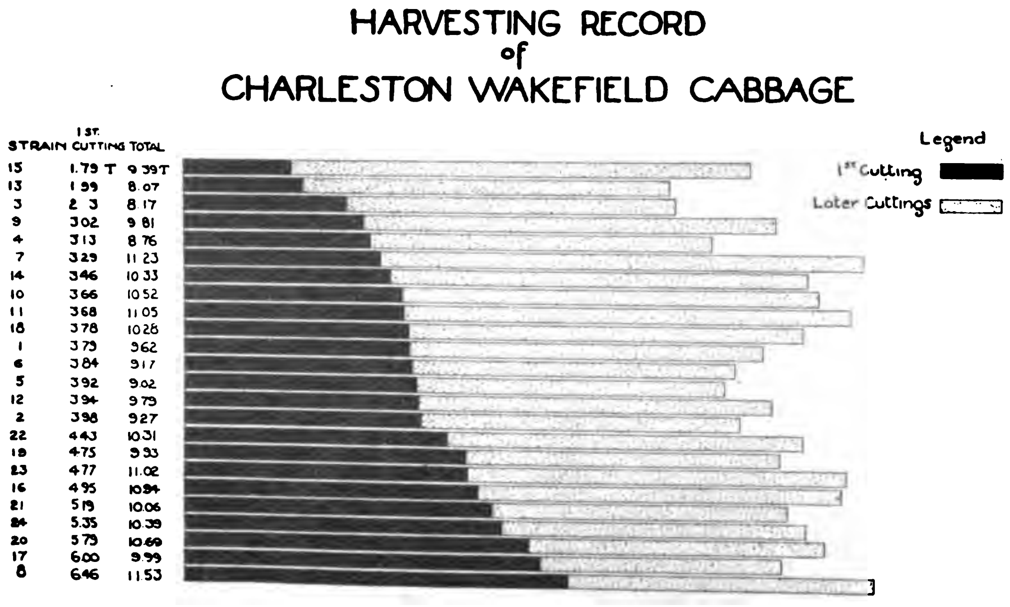


Fig. 377.— Variation in Yield of Strains of Charleston Wakefield Cabbages

Strain 6 was secured from a private grower on Long Island who advertised seed for sale at $5 per pound, with the understanding that the purchaser could sow half of it, and if he was not pleased with the result at the close of the season could return the part which remained and have the charge canceled, or if it proved satisfactory pay the advertised price. A study of the table shows that the seed was the best of the test, and from the standpoint of earliness of maturity was far superior to strain 4. In fact it will be seen that the difference in the financial value of the crop at the first cutting from one acre would approximate $140. The test also shows that some of the other strains were quite desirable. Thus when the general planting is made the following year it may be done with the assurance that the seed sown will give reasonably good results. Certainly there are few operations with which the gardener is concerned which will yield as large returns for the time and money invested.

Fig. 377 shows the variation in strains of Charleston Wakefield cabbage, each of which was secured from a different seedsman.

In this discussion we have concerned ourselves only with the good seed question with respect to cabbage. However, there is abundant evidence to substantiate the belief that the facts here illustrated are applicable to vegetable crops in general as well as to farm crops.

THE SEED BUSINESS FROM THE DEALERS' STANDPOINT

H. W. Gordinier, Troy, N. Y.

Here we picture the seed business which, in at least one respect, is the most unique in the world. I refer to the non-warranty with which every reliable seedsman sells his stock. It is a fact that we cannot buy a pound of seed, a ton of seed, a bushel of seed, a pint of seed, from any reliable seedsman that does not contain the following statement, either on the package or in the bag: "John Doe & Co., gives no warranty, express or implied, as to description, quality, productiveness or any other matter, of any seeds they sell. They will not be in any way responsible for the crop. If the purchaser does not accept the seed on these terms it is to be returned at once."

With almost anything else we buy we can tell something of the quality of the goods, and that about which we do not know the salesman will give us a guarantee. However, the seedsman will guarantee nothing. Therefore, it is apparent that the seed business is one in which the good reputation of the seedsman counts for much — very much. Indeed, it is his stock in trade.

WHERE THE SEED COMES FROM

With the exception of peas, beans, corn, lettuce, onions and the vine seeds, from 50 to 75 per cent. of the best vegetable seed comes from Europe. From Denmark we get our cauliflower and varieties of selected cabbage. From Germany we get choice stocks of flower seeds and selected beets, mangels, vetches and rapes. Indeed, we get at least 50 per cent. of our flower seed from Germany, with the exception of sweet peas which are grown in California on about 3,000 acres. From France we get seed of the finest root crops, such as carrots, parsnips and radishes, and

French-grown celery seed commands the very highest price in the American market. (I take the following quotations from to-day's list: "Golden Self Blanching Celery, true French stock, $18.00 per pound. American-grown Golden Self Blanching seed $5.00 per pound.") From England we receive various seed crops, especially mangels, turnips, parsnips and herbs, together with special varieties of sweet peas. From Belgium we get the sugar beets and special sorts of mangel-wurzel. This list is by no means complete, but I simply site these particular varieties to show that the whole world contributes its share of seed for American growers.

Cannot we produce all these seeds in this country? We can; but why don't we? It is simply a question of expert labor. We buy these vegetable seeds in Europe and devote our time to the cultivation of wheat, corn, cotton and various other crops.

HOW THE SEED IS BOUGHT

The seed business is also unique in its uncertainty. We never know what quantity of seed we shall receive, for contracts are made one, two, three and four years in advance of the harvest. Our contracts always read that we must stand the shortage on any failure of the crop, but the contractor agrees to plant the necessary acreage to produce the quantity for which we contract. Today I contracted with an English house for the growing of 4,000 pounds of Norbitan Giant Mangel to be delivered after 1917. I need just this amount for my normal trade. How much will this house deliver? I have not the least idea.

There is a very limited open market for the big seedsman of the country. If contracts are not delivered in full it means an almost universal shortage in that particular variety. As an instance of this I site a personal case which occurred this year. I had a contract with a French house for Golden Self Blanching celery, but the crop was a failure and it was absolutely impossible for me to buy more than a tenth of what I needed for my normal trade, and this was purchased in the open market at an advance of 270 per cent. over the price at which the seed had been contracted.

HOW THE SEED IS CARED FOR

When the seed arrives from Europe and has been released from the custom house, it is delivered immediately to our warehouses. Then comes the most exacting part of the business, known as "stocking the seed," and, since so much depends upon the accuracy of this work, we allow only one man to stock it. On him rests the entire responsibility. He tags each bag with the English name of the seed contained therein and gives to each bag a distinctive number by which it is identified while the seed is in our hands. If this man makes a mistake in tagging, his error will not be discovered until the damage has been done, and then not by ourselves but by our customers, for it is only in the growing that such errors are brought to light.

However, we generally carry a two-years' supply and make a trial planting ourselves to determine positively the exact variety. Sometimes, owing to short crops, we can not make such a trial; hence we protect ourselves with the non-warranty I mentioned. We can tell nothing about our stock without such tests. About thirty varieties of radishes are listed, each distinct as to color, size and shape, yet the seed is all alike. We also list about fifty varieties of cabbage, each distinct as to time of maturity and size and habit of growth, yet the seed is all alike.

The number is entered on a card with all other information, such as the name of the grower, the year grown and the variety and test. The test, however, can not be entered until 100 seeds have been taken from each bag and sent to the official tester for germination test. After the report of the test is returned the seedsman has a farily complete record of his stock. Is it correct? He does not know — for he will have to wait one full season to determine that. The proof of the record is only in the growing of the seed.

We have now the only positive information of our seed stock available. We know just how many seeds out of every hundred will grow under absolutely perfect conditions. A grower may buy that very lot, and it may never show up in the garden. He may register a complaint on the quality or the variety and the poor seedsman will hide behind his non-warranty. He need not say that the seed was no good because it did not grow for him, because the seedsman can look up his records and learn the exact vitality of the seed. Perhaps the seed did not grow owing to conditions over which the seedsman had no control; such as poor planting, lack of water, or too much water, or for want of other requirements necessary to its growth.

I know there is a popular belief that the seedsman keeps the good stock and sells the dead. While he does not keep the good stock, he nevertheless does sell the dead stock. He sells the spent, or dead, celery seed to wholesale grocers for flavoring. He sells the spent pumpkin and squash seed to druggist for medicinal uses. The spent beans and peas are sold for food in the large cities. All the rest of his dead stock he really and truly destroys.

His success depends entirely upon his reputation as a seedsman and this in turn rests solely on the growing quantity and quality of his seeds. Therefore, in spite of the non-warranty used by every reliable seedsman, one need have no hesitancy in placing an order with any leading seedsman in the county, for he will do the very best he can to fill it only with high-grade seed of strong vitality.

GROWING EARLY PLANTS

E. H. Hallett, St. Johnsbury Center, Vt.

A successful crop from the garden depends largely upon the plants we use. Many lose sight of this and use anything that is a plant, regardless of its vitality and ability to produce.

Let us first consider that plant and animal are practically the same — both have to eat, drink and breathe — therefore essentially they should be cared for in about the same way. The dairyman of today, if he wishes to raise a cow that is a great producer, must start as soon as life begins. He must take charge of the animal every day seeing that it has the proper amount of feed, drink and air. He must see that not a day passes but that the animal increases in growth. If at any time it has not received the necessary feed and care its capacity for production may be injured.

Plant life is exactly the same. We find when talking with people about plants that they want them stocky, well-colored and vigorous for setting. But do we always get such? No; because we do not take enough care in growing them. Often we who grow for the market are so eager to get bigger returns from the amount of space that the plants have to suffer.

FORCING HOUSE

In growing early plants it is necessary, especially in this northern country, to have a greenhouse for sowing the seed and forcing to the time of transplanting. Beginners are sometimes frightened at the expense of this, but they need not be, for a house that is small, with good light and well-heated will do as well as one costing thousands of dollars. Two hundred dollars will build one in which 50,000 plants can be started as well as in a more expensive house.

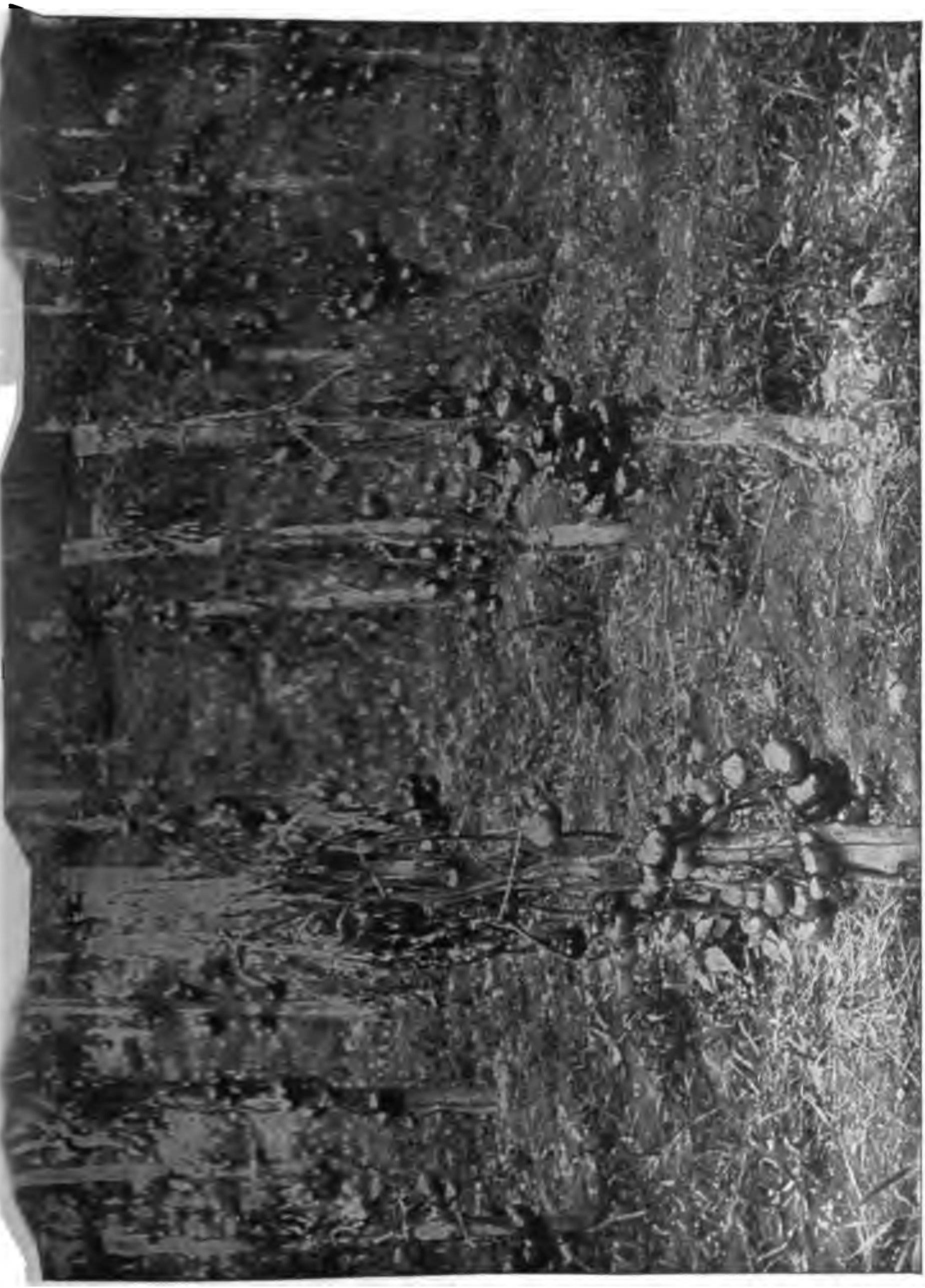


FIG. 378.— TOMATOES GROWN ON STAKES. FRUIT SUPERIOR TO THAT GROWN UNDER ANY OTHER METHOD

The first very necessary thing is heat. We find the seeds themselves are very sensitive to heat, and by experimenting, the same seed will range from 40 to 99 per cent. in germination according to the amount of heat. We find the nearer 75 degrees the temperature is kept the better.

SOWING THE SEED

The manner of sowing the seed is very important. The old-time way of sowing broadcast in flats or beds should be abandoned. There are always some that will be crowded by this method and thus grow slender and become practically worthless. We would recommend always sowing all seeds in rows. This will give all the same chance if covered in the same depth and all receive the same amount of sun — which plants need very much.

Each grower must determine when to sow his seeds; this depends upon the time they usually will be liable to go into open ground. I allow about six weeks for tomatoes, cabbage and cauliflower, and twelve weeks for celery.

Flowering plants may be grown to good advantage with the vegetables as the greenhouse can be used after other plants are out in hotbeds. The following flowers are most called for: Asters, Verbenas, Petunias, Zinnias, Salvias and Pansies. Many more plants can be grown per square foot.

In the selection of flower seeds, buy only the best and those that have been tried out. One does not want to be disappointed at the close of the season by not getting large and handsome flowers.

The methods of growing plants are practically the same as for vegetables.

DISEASES

Diseases that attack plants in the seed bed should be well looked after. Perhaps the one having done the greatest amount of damage is what is known as " damping off." This is a fungous disease that attacks the plants at the surface of the earth, and is caused by an over amount of moisture there. This excess moisture soon decays the shanks of the plants which drop over and in time die. Some recommend transplanting as soon as this condition is found, and placing sand around the plant when set. We find that a better method of prevention is by covering all seeds with a fine, sharp sand, instead of covering with the same soil. This gives a very quick and proper drainage. Since adopting this method, seldom, if ever, is a plant found diseased. Care should be taken to keep the surface quite moist until the plants have broken the ground. Then the time has arrived when the work must be thoroughly looked after — that not an hour passes but what the small plants grow. Give plenty of heat and ventilation but avoid heavy draughts directly upon the plants.

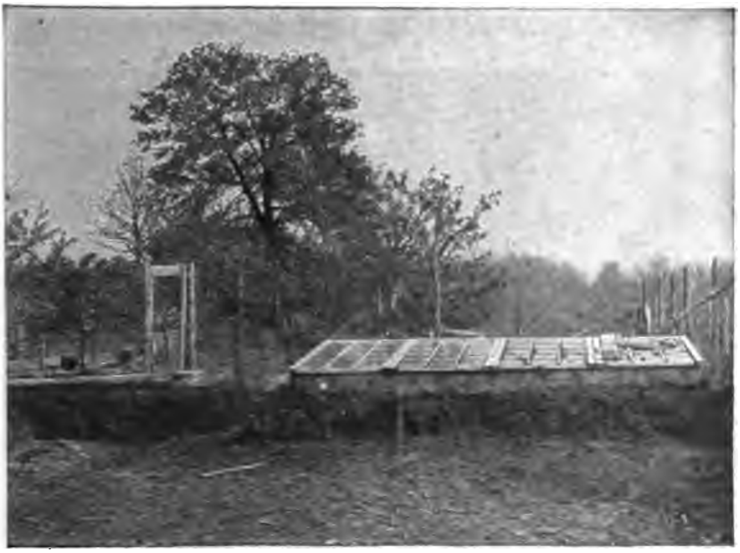


FIG. 379.— SIMPLEST FORM OF MANURE HOTBED. THE FRAME IS PLACED ON A PILE OF FERMENTING MANURE

TRANSPLANTING

Transplanting is a very important part of the work. Plants should first be set when the third leaf appears and should be evenly spaced so that all will have an equal chance for development of the root system. A plant without roots is worthless. Some fear the cutting of any roots, and thus advocate potting plants instead and shifting from time to time as growth advances; but we find the cutting of roots by transplanting several times produces a plant capable of feeding more rapidly, and one which will produce more fruit.

Great pains should be taken not to allow inside plants to become too tender before removing into hotbeds. We find that tomatoes and celery do best if removed to hotbeds to finish up. Cabbage and cauliflower do best in cold frames.

In transplanting tomatoes into beds care should be taken to space evenly. Usually good plants can be grown three by five inches, allowing them to get from ten to twelve inches tall when put upon the market. Keep well ventilated; the last few days the glass should be entirely taken off.

Sometimes the green aphis works havoc with them. Tobacco smoke will rid the plants of this pest, but it must be used often and should not be allowed to remain in the building too long.

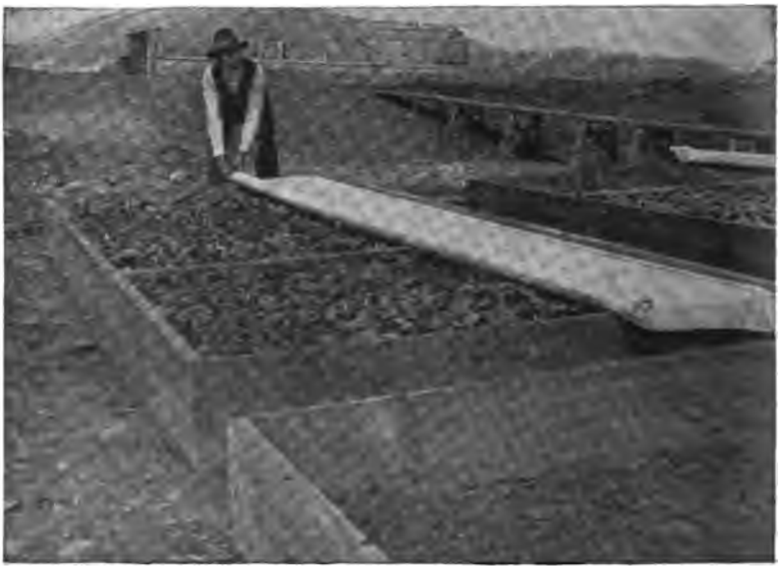


FIG. 380.— A CLOTH-COVERED COLD FRAME

PREPARING FOR MARKET

My method of putting up for the trade is as follows: All small plants are well wrapped in damp moss. These can be sent by parcel post very satisfactorily. Tomatoes are more trouble. They are shipped in boxes or flats nine by twelve inches, and three inches deep, with a strip of shingle nailed in each corner of the box. The plants are cut out and placed upright in these boxes, which hold just twelve plants, after which twine is tied around the tops of strips. This keeps the plants from tipping and being damaged. They may be shipped by freight or express without trouble.

Grow only good plants and good prices can always be obtained for them.

RETAIL PRICES RECEIVED

The following is what we receive for the different plants: Tomatoes, 50 cents per dozen; cabbage, 50 cents per hundred; cauliflower, $1.00 per hundred; celery, 90 cents per hundred; peppers, 30 cents per dozen. For Asters, Petunias, Zinnias and Verbenas we receive 25 cents per dozen; for Salvias, 50 cents per dozen; Pansies, 25 cents per dozen.

After giving a brief outline of growing early plants, we must bear in mind that to be successful in the growing of plants and vegetables one must love plant life. He must know the exact needs of each plant; he must be quick to detect insect pests and plant diseases and immediately apply a remedy. Only a few hours sometimes will mean the loss of the entire crop. It is better to use a preventive rather than risk the use of cure later.

DISEASES OF VEGETABLES

PROFESSOR J. C. JAGGER

Assistant Professor of Plant Pathology, University of Rochester, Rochester, N. Y.

CAUSES OF DISEASES

Diseases of plants result from several causes. Unsuitable soil and weather or improper cultural methods are often the cause of unhealthy plants. Insects are more or less injurious to all crops. Many diseases result from the growth within affected plants of minute parasitic plants known as fungi and bacteria. Other diseases, which appear to be of importance in New York State to the growers of the vegetables treated in this bulletin, are briefly discussed.

METHODS OF CONTROL

Vegetables can not be cured of disease as can men and animals. They must be protected from the attack. The method of control to be employed for a given disease is determined by its cause and by the nature of the crop attacked. Evidently diseases resulting from conditions of soil, weather or culture can be avoided by making conditions suitable or by growing crops, varieties or strains of plants which are not injured by the conditions. Control measures to be employed against the many diseases resulting from the attacks of parasitic fungi and bacteria depend primarily on the nature and habits of the parasite.

Crop Rotation. Many parasites live from year to year in the soil and will die out and disappear if crops are so rotated that susceptible crops are not grown in an infested field for a few years.

Soil Sterilization. Several diseases, resulting from parasitic organisms which gain entrance to the plants from the soil, are very effectively controlled by soil sterilization. This treatment is limited by its high cost to use in greenhouses, plant beds and similar places, where small areas bring large returns.

Steaming is the most satisfactory means of sterilization. Three methods are commonly used. A galvanized iron pan, five to ten inches in depth and any convenient size, is inverted over the soil and live steam passed into it. A drag-like arrangement with many perforated perpendicular pieces which are jabbed down into the soil is occasionally used. Many prefer to lay perforated iron or galvanized pipes in the soil horizontally at a depth of two to seven inches and a foot or more apart, covering the surface with canvas or paper to hold the heat. A steam boiler giving at least 40 pounds pressure, and better 80 to 100, should be used. Steam is usually applied for one to two hours. For the treatment to be fully effective all parts of the soil to a somewhat greater depth than worked must be heated to a temperature of around 200 degrees, Fahrenheit, and held at that temperature for a time.

Drenching the soil with formaldehyde solution is sometimes as effective as steaming, but can be recommended only for very small areas. Use one pint of 40 per cent. formaldehyde to six or seven gallons of water, and apply with a sprinkler at the rate of one gallon per square foot. A weaker solution is often recommended but can not be relied on to give satisfactory results. Crops must not be started until two weeks after the application.

Clean Seed and Seed Treatment. Several parasitic fungi and bacteria are perpetuated in or on the seeds of the crops, and the resulting diseases can be wholly or in part controlled by selecting seed free from the parasite or by treating the seed to kill the parasite. Where the parasite is within the seed, methods of killing it have not been determined, and the selection of disease-free seed must be practiced. Parasites on the surface can usually be killed by a short soaking in a weak solution of formaldehyde or corrosive sublimate.

Resistant Varieties. One of the most promising methods of controlling vegetable diseases is by the development and use of disease resistant varieties and strains. There are very few strains and varieties of vegetables which resist disease, but there are sufficient to indicate great possibilities. Growers can accomplish considerable in obtaining more resistant varieties and strains. If a plant is decidedly more free from disease than its neighbors, save seed from it and try it out the next year. Plant different varieties and examine for differences in disease resistance.

Spraying. Many blight and dead spot diseases can be controlled by applying some material which is destructive to the causal parasite but harmless to the crop. For perfect control all susceptible parts must be kept coated with the spray material in order to prevent entrance of the parasite, for once entrance has been gained spraying is useless. Spray before rains, not after, for the parasite requires moisture to gain entrance to a plant, and well-made spray mixtures do not wash off. Bordeaux is the standard material for vegetable spraying. For fruits lime-sulphur has largely taken the place of bordeaux, but it has in no case been sufficiently tested on vegetables to warrant its substitution for bordeaux. Careful tests have shown that in some cases lime-sulphur actually checks the growth of vegetables.

Bordeaux, 5-5-50, which is the formula usually used, consists of 5 pounds copper sulphate, 5 pounds high-grade stone lime and 50 gallons water. The copper sulphate is dissolved by suspending in a sack in the top of a few gallons of water in a wooden vessel. The stone lime is slaked in a separate vessel by adding water a little at a time. Both are then diluted to 25 gallons and poured together in this diluted condition. After thorough stirring the mixture is ready for use. Fresh hydrated lime may be used in place of the stone lime. If there is any doubt about the lime being high-grade and fresh, get an ounce of yellow prussiate of potash at a drug store, dissolve it in a pint of water, and add a few drops to the well stirred bordeaux. If the solution shows no change in color the bordeaux is all right, but if it turns dark brown as soon as it strikes the bordeaux, the lime was either low-grade or air-slaked, and the bordeaux will burn foliage if used. Add lime from a fresh supply until the prussiate solution does not change color.

Where smooth glossy plants like asparagus are sprayed, it is advisable to use a sticker with the bordeaux. Boil 2 pounds resin, 1 pound sal soda crystals and 1 gallon water in an iron kettle until clear, which requires one to one and one-half hours. Add this to 50 to 100 gallons of bordeaux.

For best results in spraying at least 100 pounds pressure must be used. It is usually impossible to obtain over 50 pounds pressure with hand sprayers. By expending much time and labor satisfactory spraying can be done on small areas with hand sprayers, but they are out of the question for field work. Use a horse-drawn sprayer which derives power from the wheel or a gasoline engine.

GENERAL DISEASES

Damping Off. Seedlings and weak soft plants are subject to rotting off at the surface of the soil and consequent toppling over. Damping off is most injurious to plants grown indoors or under crowded conditions. The disease results from the attack of any one of several species of fungi.

Injury can often be largely avoided by so regulating moisture, temperature, ventilation and spacing of plants as to produce as stocky, vigorous plants as possible. High temperatures and an excess of moisture favor the growth of the causal fungi and should be avoided. Where trouble with damping off has been experienced it may be expected that the same soil will continue to give more or less trouble. This can be overcome to a large extent by using new soil or by sterilizing, for which see soil sterilization.

Root Knot or Nematode Galls. Root galls (Fig. 381), varying in diameter from one-thirty-second to one-half inch, occur on a great variety of plants, resulting in diminished vigor and decreased yields. They are due to the entrance into the roots from the soil of microscopic worms. In this climate injury usually occurs only in greenhouses, for outside the worms are largely killed by the cold of winter. In badly infested houses lettuce and radishes are not appreciably injured, but the yield from tomatoes is noticeably lowered and cucumbers are almost a failure. Thorough steam sterilization of the soil is the only remedy that can be relied on to eradicate the disease.

ASPARAGUS

Rust (*Puccinia asparagi* DC.), Fig. 382. Rust is the most common disease of asparagus and very destructive in some sections. Disease lesions do not occur on shoots cut for market but older bushy tops become covered with reddish or black pustules.

The life of affected tops is considerably shortened, thus preventing the normal manufacture and storage of food in the roots and shortening the succeeding season's yield.

Bordeaux, 5-5-50, with resin sticker added, applied three to five times at intervals of ten days after cutting ceases, reduces the amount of disease. Spraying has not proved generally satisfactory on account of expense and incomplete control. The development of disease resistant strains bids fair to solve the problem. The United States Department of Agriculture has bred a

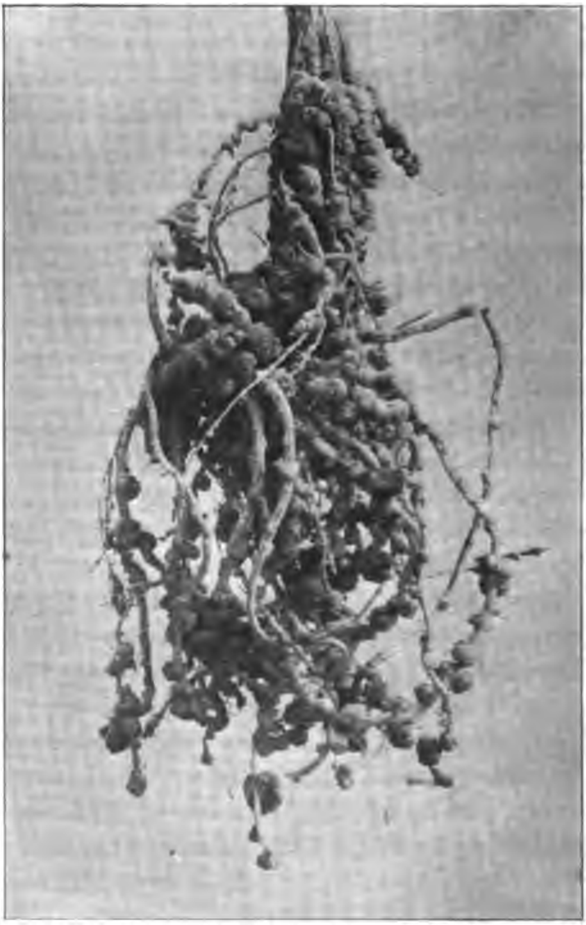


FIG. 381.— ROOT KNOT OF GREENHOUSE CUCUMBERS

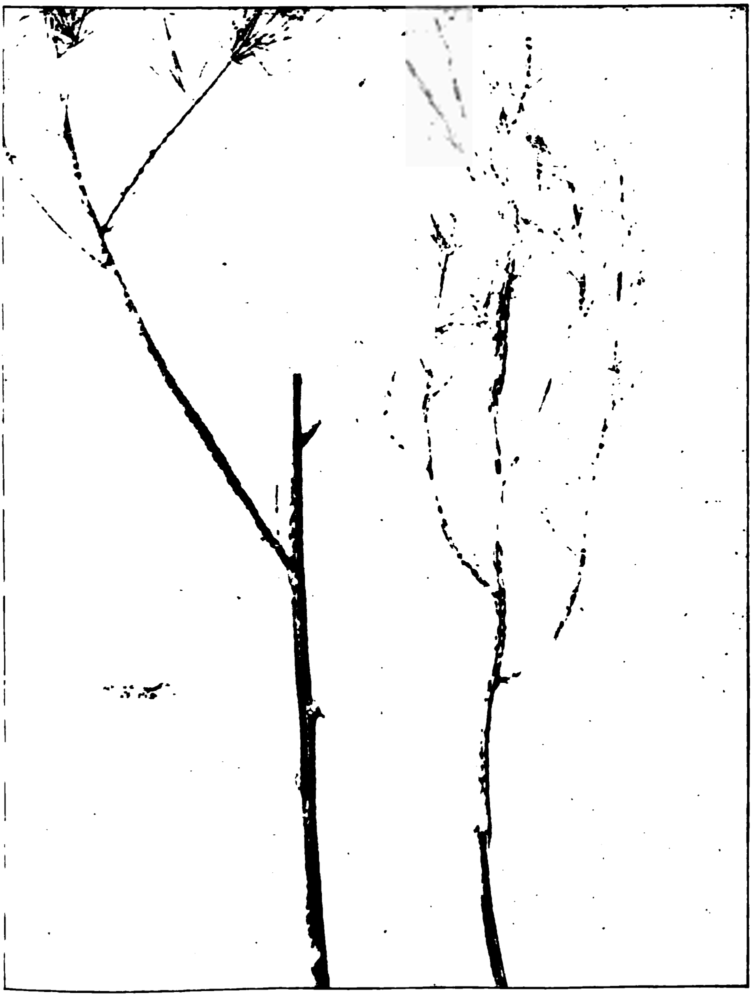


FIG. 382.— ASPARAGUS RUST

strain of asparagus which is immune to the disease under Massachusetts conditions and seed has been distributed for trial in other localities.

BEAN

Anthracnose (*Colletotrichum lindemuthianum* Bri. & Cav.), Fig. 383. This is a fungous disease also known as rust or pod spot. Rusty brown or reddish sunken spots occur on the pods with similar spots on leaves and stems. Seed from disease-free regions or from selected disease-free pods will, it is believed, produce disease-free crops. Seed treatment or hand picking of seed is useless. Spraying has not been profitable.

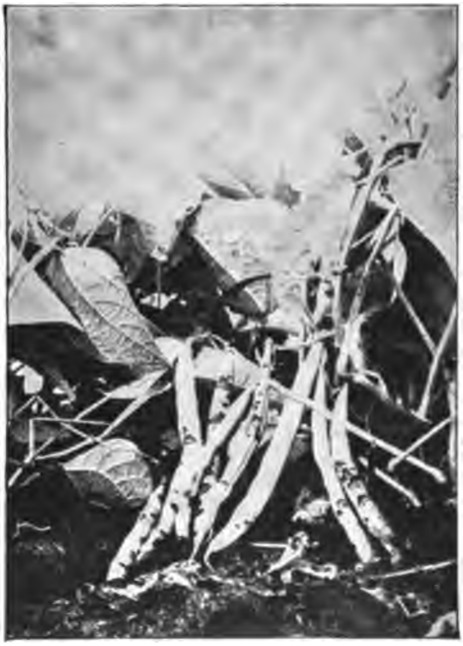


FIG. 383.— BEAN ANTHRACNOSE

Blight (*Pseudomonas phaseoli* Erw. Smith), Fig. 384. Irregular water-soaked patches appear on leaves, stems and pods, which later become dried out and brownish in color. Diseased seed is the main source of the bacterium which causes the disease. Statements above in regard to the control of anthracnose are largely applicable.

CABBAGE

Black Rot (*Pseudomonas Campestris* Erw. Smith). This disease is readily distinguished by the presence of brown or black veins in leaves and cross sections of leaf stalks and plant stems. Badly affected plants are stunted and many of the lower leaves may drop off. The disease originates from the presence of a parasitic bacterium either on the seed or in the soil. All danger of disease from seed is removed by soaking for fifteen minutes in a solution of corrosive sublimate, one ounce dissolved in seven gallons of water, or in formaldehyde, one pint to thirty gallons of water. Susceptible crops should not be grown on soil where the disease has occurred until a few years have elapsed. Cauliflower, rape, kale, turnips, wild mustard and other cruciferous plants are also susceptible.

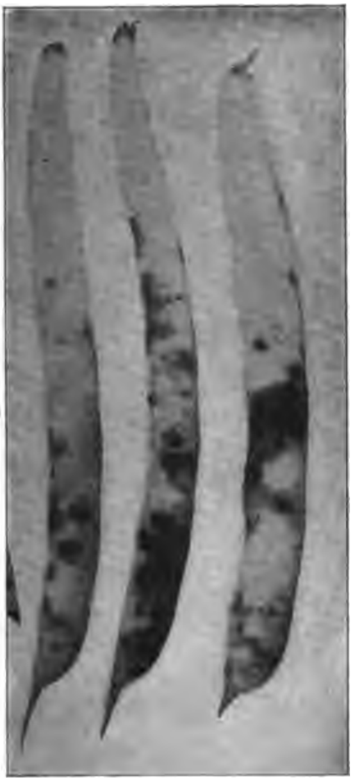


FIG. 384.— BEAN BLIGHT

Club Root (*Plasmodiophora brassicae* Wor.), Fig. 385. Unsightly swellings occur on the roots of cabbage, cauliflower, turnips, radishes, shepards purse, wild mustard and other related plants. The causal parasite lives in the soil. It is best controlled by rotating crops so that a susceptible crop is grown on a given field only every fourth to seventh year, but in the meantime the field must be kept free from weeds on account of the susceptibility of many weeds. If infested soil must be used apply lime at the rate of three to five tons per acre. Apply and harrow into the soil the fall before planting, or better, a year or two before.

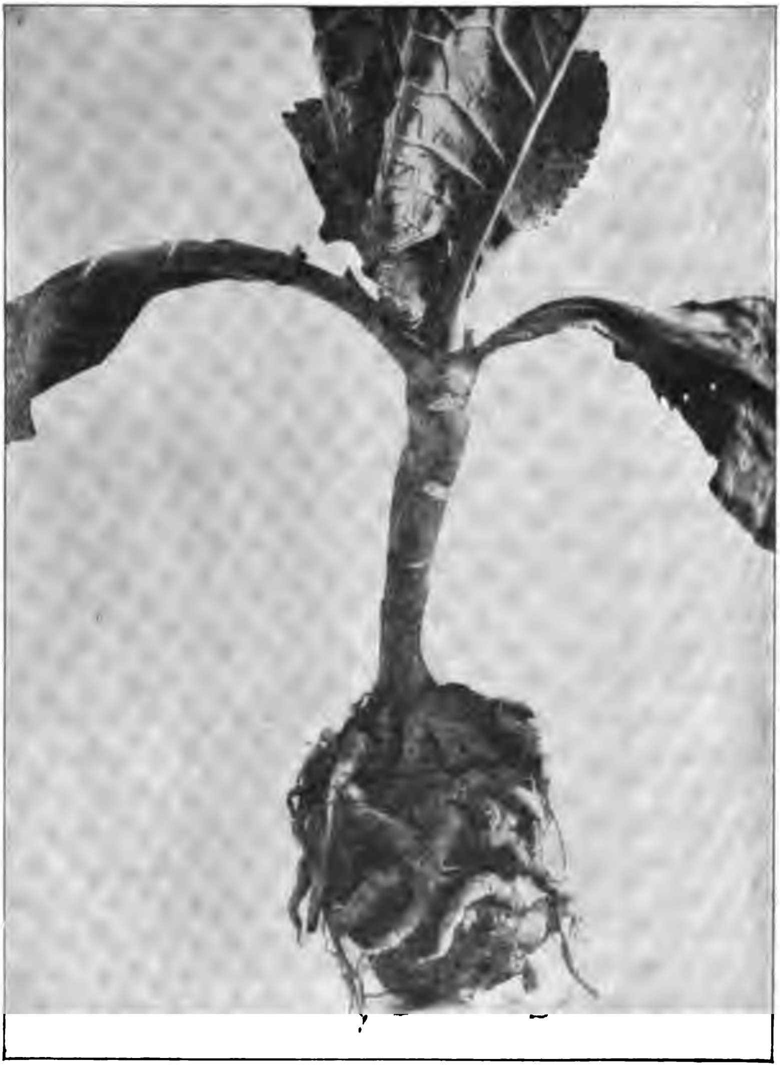


FIG. 385.—CLUB ROOT OF CABBAGE

CAULIFLOWER

Black Rot and Club Root, discussed under cabbage, are the important diseases.

CELERY

Blight (*Septoria petroselina* Desm., var. *apii* Br. & Cav.), Fig. 386. It is probable that the yellowing of celery leaves, resulting from unfavorable soil and weather conditions, is sometimes called blight. True blight is, however, caused only by the attack of a fungus. It can be readily distinguished from all other troubles by the presence of brown dead spots in the leaves and rusty brown areas on the stalks, in both of which there occur small black specks, readily observed only on close observation. Thorough spraying with bordeaux, 5-5-50, effectively controls the disease. It can sometimes be checked to a certain extent by beginning spraying after it has appeared, but generally satisfactory

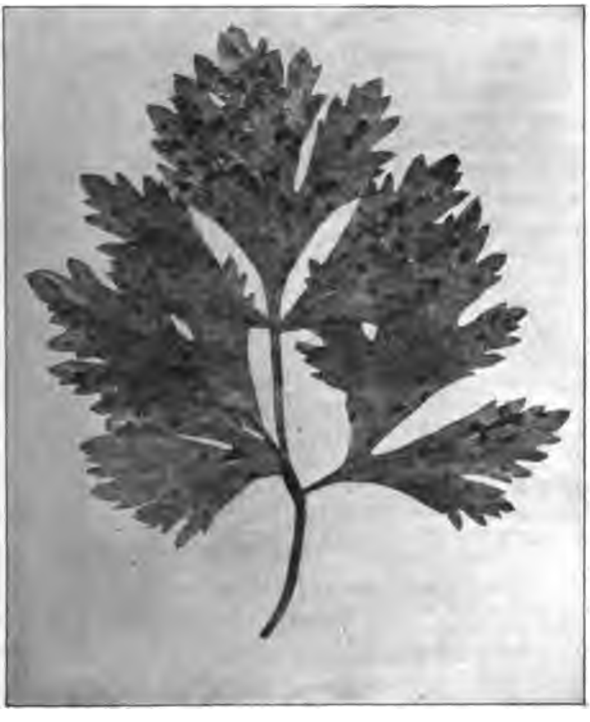


FIG. 386.—CELERY BLIGHT

results are obtained only where spraying is begun as soon as the plants become established in the field and repeated at regular intervals throughout the season. Spray every ten days.

Pink Rot (*Sclerotinia libertiana* Fuckel), Figs. 387 and 388. This fungous rot is sometimes very destructive to celery in trenches and rarely in cold storage. Many other rot fungi attack stored celery, but none cause such a rapid and complete decay. The disease is readily distinguished by the presence on softened parts of dense cottony wefts of mold, within which black irregular bodies 1/32 to 3/8 inch in diameter are developed. These are the resting bodies of the fungus and serve the purpose of seeds. The same fungus attacks lettuce, carrots, cabbage and other plants. It can always be distinguished by the mold and resting bodies.

Control methods are uncertain. Probably much can be done to reduce the amount of disease on all attacked plants by diligently removing and destroying all diseased material bearing the fungus resting bodies. Celery trenches should be ventilated as much as possible, for heat and moisture favor the growth of the fungus.

CORN

Smut (*Ustilago zeae* Ung.). The familiar smut boils occur on corn wherever it is grown and often results in noticeable losses. The causal fungus remains in the soil from year to year or is brought in with manure where infested corn is fed. The fungus is killed in silos. Crop rotation and the use of uninfested manure reduces the disease. Go through the fields several times each year and cut out and burn the smut boils before they burst open. This continued yearly will result in continued diminution of smut.

CUCUMBER

Wilt (*Bacillus tracheiphilus* Erw. Smith), Fig. 389. Usually whole plants show a rather sudden wilting with no apparent cause. The disease results from the clogging of the water vessels of the plant by a bacterium, which gains entrance to healthy plants largely through the feeding punctures of striped beetles and other insects. Cantaloupes, pumpkins and squashes are also subject to the disease. Sure methods of control are unknown, but it is probable that crop rotation, the early removal and destruction of

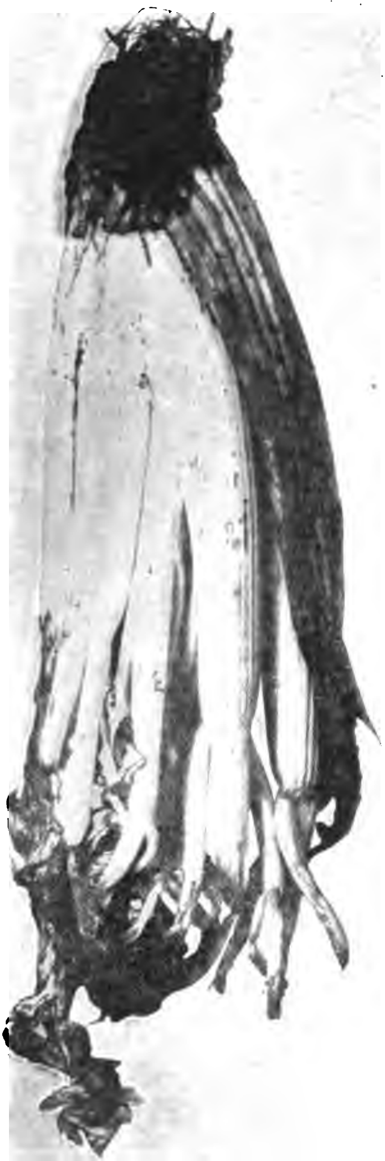
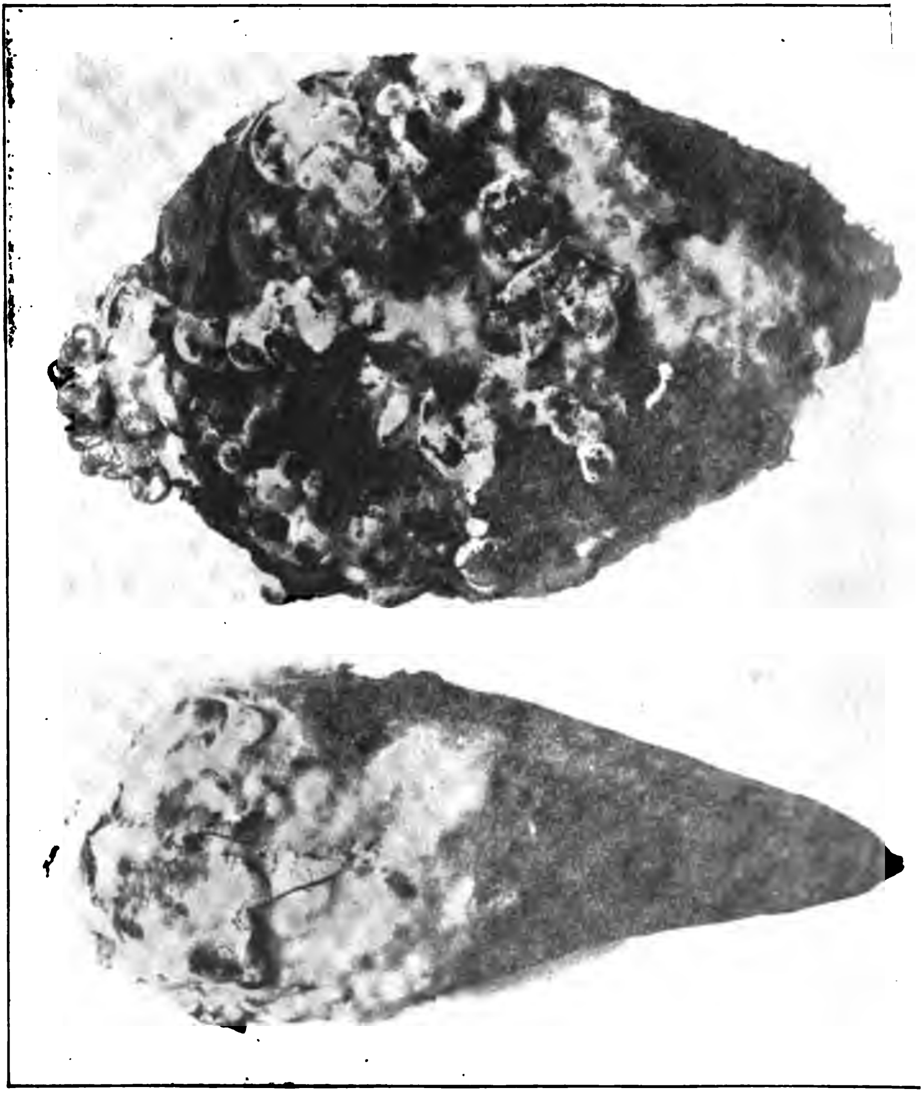


FIG. 387.— CELERY PINK ROT



diseased plants, and the control of striped beetles and other insect enemies are of value.

Downy Mildew (*Plasmopora cubensis* Humphrey), Fig. 390. This is a very destructive disease to both cucumbers and cantaloupes in regions where it commonly occurs, but outside of Long Island it seems to appear only occasionally in this state. The first symptom is the appearance of yellowish angular spots in the older leaves, which increase in number and size, spreading to younger leaves and finally killing practically all leaves.

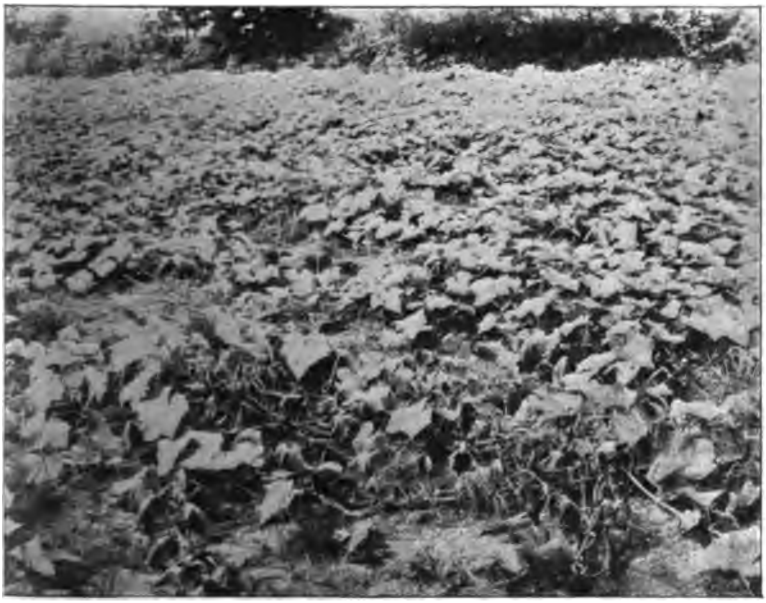


FIG. 389.— CUCUMBER WILT

Thorough spraying with bordeaux, 5-5-50, controls the disease and is very profitable where it is destructive. Begin spraying when the vines begin to run and repeat every week or ten days throughout the season. There is little use to begin spraying after the disease appears.

Leaf and Fruit Spot Diseases. There are several distinct diseases, resulting from the attacks of several species of fungi, which cause dead spots in leaves and fruits. Wherever sufficiently destructive to warrant control measures, all can be prevented by spraying as for downy mildew.

White Pickle, Fig. 391. Fruits are light colored and stunted. They are often mottled with yellow and green. The green blotches may stand out as warts. The leaves turn yellow and affected plants eventually die. The disease has been known only a few years but occurs in many localities. Nothing is known in regard to its nature, cause or remedies. The same or a very similar disease is destructive to greenhouse cucumbers in some localities.

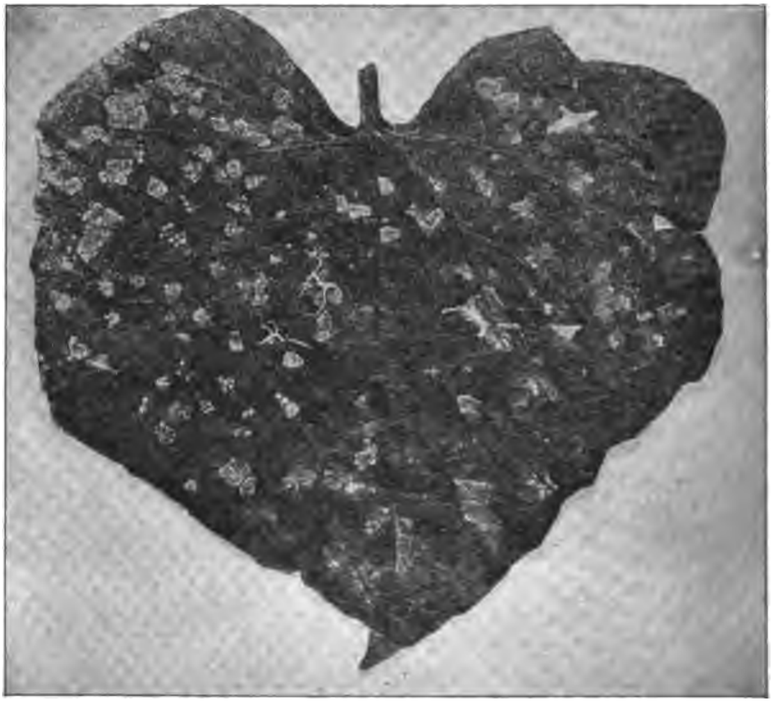


FIG. 390.— CUCUMBERS DOWNY MILDEW — EARLY STAGE

LETTUCE

Tip Burn. The edges of the leaves die and turn brown, making the product less salable and in severe cases decreasing yields. Various combinations of climatic conditions, resulting in a too rapid loss of moisture from the lettuce leaves, are responsible for the disease. It is usually brought about by two or three warm, moist days, resulting in a soft, watery growth, followed by a warm, bright day, when there is a rapid loss of moisture. Under glass such conditions can be avoided but no remedy is known for outdoor lettuce. The only hope lies in obtaining varieties or strains less subject to the disease.

Rhizoctonia Rot (*Corticium vagum* B. & C., var. *solani* Burt.), Fig. 392. This is a very destructive disease of outdoor lettuce in this state and is of considerable importance in greenhouses. The rot begins where the bottom leaves rest on the ground and gradually works up into the head, destroying the blades of the leaves and usually leaving the midribs and stem more or less intact. Under glass, care in watering, so as to keep the leaves and surface of the soil as dry as possible, usually holds the disease in check. Outdoors little can be done towards controlling it, but thorough drainage and frequent cultivation are of value. In greenhouses soil sterilization, preferably by steaming, insures crops free from the disease, but is out of the question for fields on account of cost.

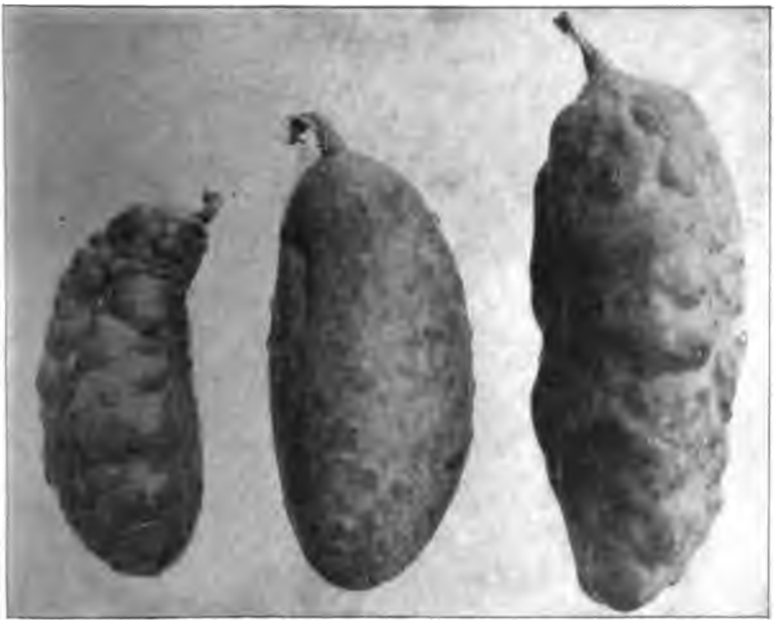


FIG. 391.— CUCUMBER WHITE PICKLE

Botrytis Rot (*Botrytis cinerea* Pers.). This rot is of no importance outdoors but is occasionally destructive under glass. Diseased parts are covered with a dirty grey fuzzy mold. The

disease attacks mainly weak plants and can be largely avoided by obtaining a strong vigorous growth. Soil sterilization is probably of little or no value.

Sclerotinia Rot (*Sclerotinia libertiana* Fuckel). This disease appears to be of minor importance in this state. Attacked plants very quickly collapse into a soft slimy mass. It is caused by the same fungus as celery pink rot and can be recognized by the mold and fungus resting bodies mentioned under that heading. The disease can be practically eliminated from both greenhouse and outdoor beds by the early removal and destruction of affected plants in each crop. Soil sterilization is effective.

MUSKMELON OR CANTELOUPE

The important diseases are, with the exception of white pickle, the same as of cucumber and the same remedies are effective.

ONION

Smut (*Urocystis cepulae* Frost), Fig. 393. This disease is destructive in many localities where onions have been grown for several years with little or no rotation. It attacks only onions grown from seed. Black streaks occur in leaves and bulbs, which when broken open are found to be filled with a dark powder similar to the smut powder of the familiar grain smuts. The disease is caused by a fungus which gains entrance to the young seedlings from the soil.

The application of a weak formaldehyde solution in the furrow with the seed at planting time is a satisfactory and extensively used remedy. The solution is made at the rate of one pound of 40 per cent. formaldehyde to 25 gallons of water. It is applied at the rate of 150 gallons or more per acre by means of a can and delivery tube attached to the seed drill. Heavy rains within 24 hours after planting may greatly reduce the efficiency of the treatment. A mixture of 100 pounds powdered sulphur and 50 pounds lime, drilled into the furrow with the seed, is of value, but in general less efficient than formaldehyde.

Blight (*Peronospora schleideniana* De Bary). This is a fungous disease similar to potato blight. Thorough spraying at regular intervals of about ten days with bordeaux, 5-5-50, containing resin sticker might be of value in preventing it. The disease usually appears only occasionally and then often not until late in the season. Crops are only occasionally noticeably shortened. Present information does not warrant spraying.

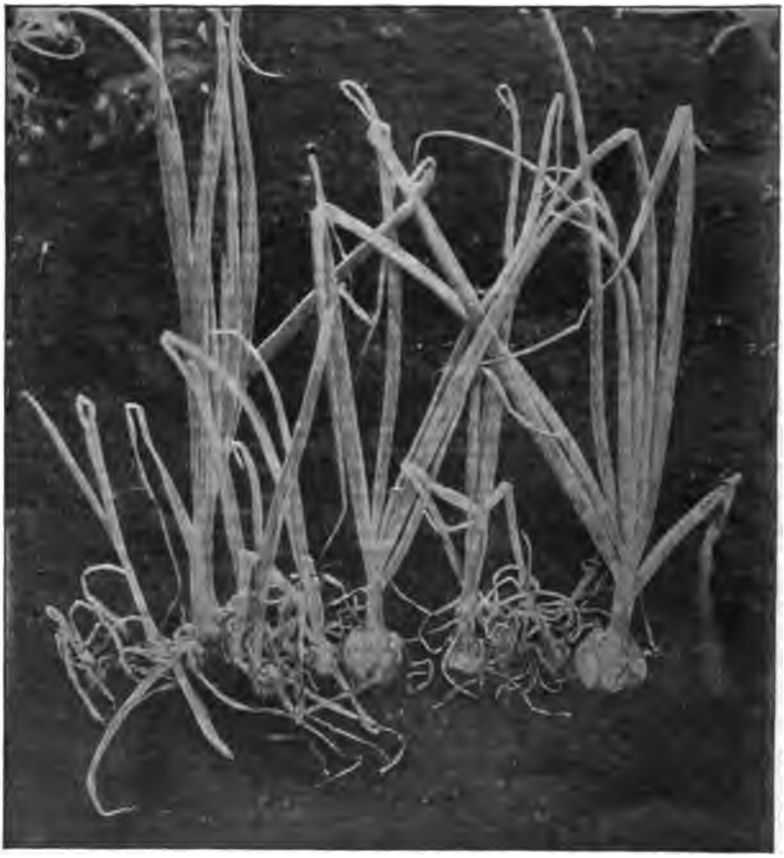


FIG. 393.— ONION SMUT; ALL DISEASED EXCEPT THREE LARGEST

PEA

Blight (*Mycosphaerella pinodes* Berk. & Blox.). Fig. 394. This disease causes marked losses in many localities where peas are extensively grown. Brown rotten spots appear on the stems of young plants and later dead spots develop in leaves and pods. The disease results from the attack of a fungus which lives over winter in the seed and in pea roots, stubble and straw. Practice

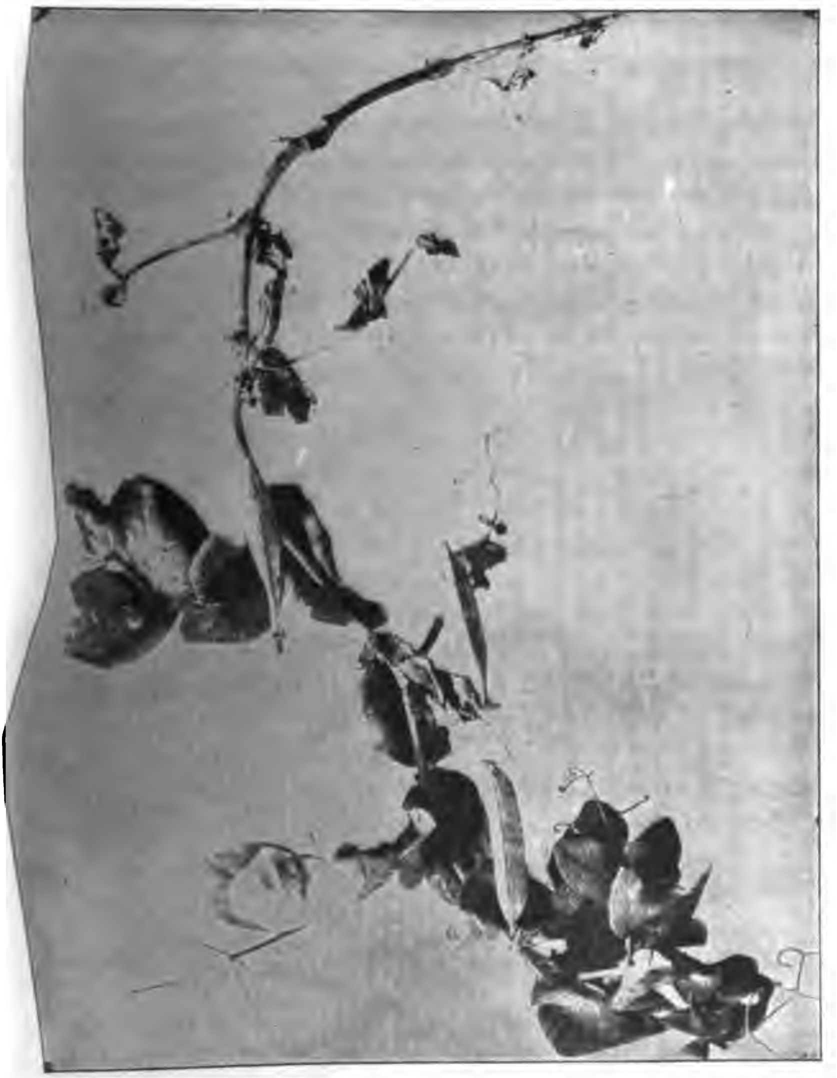


FIG. 394.— PEA BLIGHT

crop rotation. Do not put pea straw on land where peas are to be grown. The disease is introduced into fields with manure where pea vines are fed, but the disease germs are killed where the vines are used as silage. Use seed from disease-free crops. Blackish brown spots on seed are a sure indication of the disease.

TOMATO

Blight (*Phytophthora infestans* DeBary). The potato blight fungus occasionally attacks tomatoes, producing a similar blight. Spraying with bordeaux, 5-5-50, will check the disease and is advisable when it appears. Systematic spraying, as for potatoes, probably would not be profitable.

Leaf Mold (*Cladosporium fulvum* Cke.). Yellow and dead areas, covered on the lower surface by an olivaceous mold, appear in the leaves. This is primarily a greenhouse disease. Thorough spraying with bordeaux, 5-5-50, every ten days is usually recommended. Spraying has, however, not proved generally satisfactory. The disease can be largely avoided by keeping the tomato foliage and the greenhouse atmosphere as dry as possible.

Leaf Spot (*Septoria lycopersici* Speg.). Small angular dead spots occur in the leaves eventually causing them to dry and fall. Stems and fruits are also spotted. Three or four applications of bordeaux, 5-5-50, early in the season are said to control it.

Blossom End Rot. The blossom ends of half grown and larger fruits become black and more or less sunken. The nature of the disease is not fully known. Various soil conditions, including a sudden decrease in water supply, favor it. Varieties are said to differ in susceptibility.

SOME INSECTS INJURIOUS TO VEGETABLES

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CABBAGE ROOT-MAGGOT

The cabbage root-maggot (*Pegomya brassicæ*) is one of the serious pests to cabbage in New York State. The parent insect of the maggot is a small fly (Fig. 395) which resembles in general appearance the house-fly, but is considerably smaller, being only about one-fifth of an inch in length. The flies appear in the spring, usually the first half of May, and deposit their whitish eggs on the soil or in crevices of the soil close to the stem of the cabbage plant. Here the eggs hatch and the maggots attack

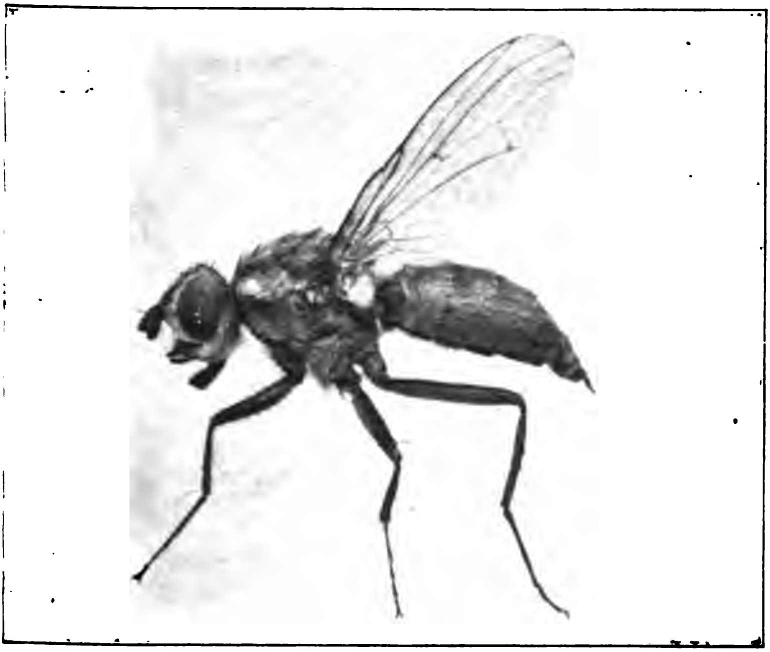

FIG. 395.— CABBAGE ROOT MAGGOT (GREATLY ENLARGED)

the plant, eating out small channels along the underground part of the stem and the roots. If the maggots are present in any numbers the plant will begin to wilt in a few days and eventually will die. In three or four weeks the maggots become full-grown and change to brown oval objects termed *puparia*, which are usually an inch or so below the surface of the soil. In about two weeks an adult fly emerges from each of the puparia and is soon ready to deposit eggs for a second brood. The insect passes the winter as a puparium in the soil. This insect is a serious pest of cabbage plants in the seed-bed as well as of plants after they are set in the field.

Control. Plants in the seed-bed may be protected by setting up boards on edge about the bed and then nailing muslin across the top. The dirt should be heaped up around the lower edges of the boards in order to prevent the flies from crawling under and gaining access to the plants. The muslin should be removed about ten days before transplanting time so as to harden the plants and prepare them for setting in the field.

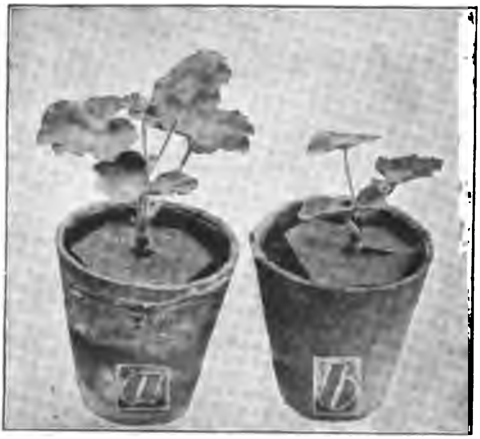

FIG. 396.—(A) TARRED PAPER CARD PROPERLY PUT ON; (B) A CARD CARELESSLY APPLIED THAT WILL NOT PREVENT

Plants in the field are best protected by placing hexagonal tarred paper cards about the stems close to the soil. These cards can be purchased ready cut from Joseph Harris Co., Coldwater, N. Y., at $1.50 per thousand. They can be quickly and economically applied in the field (Fig. 396).

IMPORTED CABBAGE WORM

The imported cabbage worm (*Pontia rapæ*) is known as the white cabbage butterfly and although it is common now wherever cabbages are grown in the United States, it is a European insect and came into New York State about 1868 or 1870. The parent butterfly has two pairs of large, strong, white wings. Each of the front wings has a black patch in the outer corner and one or two black dots near the outer edge (Fig. 397).

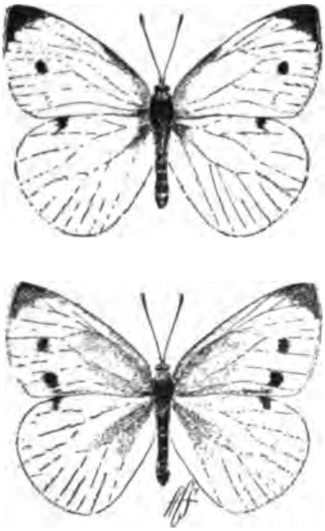

FIG. 397.—THE IMPORTED CABBAGE BUTTERFLY; MALE ABOVE, FEMALE BELOW

The butterflies appear early in the spring, and the mother insect soon begins to deposit her whitish or pale yellow eggs on the leaves of the cabbage, one in a place. These hatch in about five days, and the tiny green worms appear. The velvety green caterpillars become full grown in about two weeks and each one transforms to a pupa which, owing to its peculiar appearance and silvery markings is called a chrysalis. The insect remains in the chrysalis stage from one to two weeks when the butterfly appears, thus completing the life cycle (Fig. 398). There are at least three broods in New York. It hibernates as a chrysalis.

Control. The caterpillars riddle the outer leaves of the plant and crawl down into the head, where they injure and soil the tender white leaves.

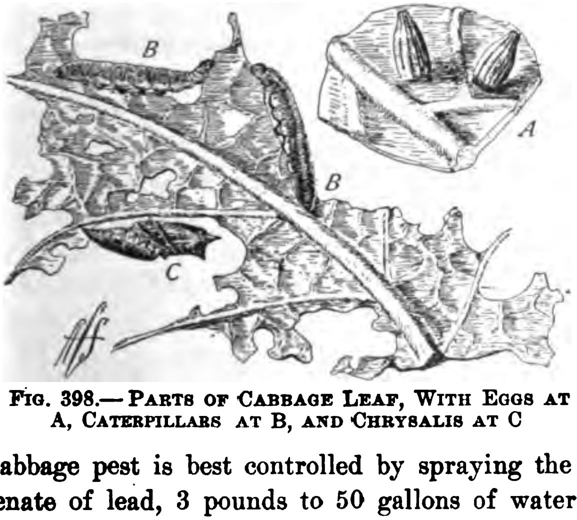

FIG. 398.—PARTS OF CABBAGE LEAF, WITH EGGS AT A, CATERPILLARS AT B, AND CHRYSALIS AT C

This cabbage pest is best controlled by spraying the cabbages with arsenate of lead, 3 pounds to 50 gallons of water, or with paris green 1 pound to 150 gallons of water. If the paris green is sifted on dry it should be mixed with 20 to 25 pounds of flour or fine air-slaked lime.

There is no danger in spraying cabbages with a poison up to the time when they are half-grown or even later. The outside leaves do not fold up about the head, hence there is little danger of enclosing the poison within the cabbage.

CUTWORMS

The well-known cutworms are larvæ or caterpillars of certain night-flying moths. There are several species of these cutworms and they attack various kinds of plants and cause a great amount of injury. They have the habit of working mostly at night and remaining hidden an inch or so below the surface of the soil during the day.

As an example of the life history of one of these pests we may take the one known as the yellow-headed cutworm. The parent moth of this cutworm usually appears through July and August and deposits its eggs at the bases of grass stems. Here they hatch and the cutworms live on the roots of the grass, attaining part of their growth by fall. They then go downward four or five inches and make cells in the soil in which they pass the winter. In the spring they return to the surface, eat voraciously, and complete their growth when they transform to pupæ in the soil, from which the moths emerge in July and August, thus completing the life cycle. The life histories of other cutworms may vary from this one but many of them agree in eating voraciously and growing fast in the spring, doing most of their damage at that time.

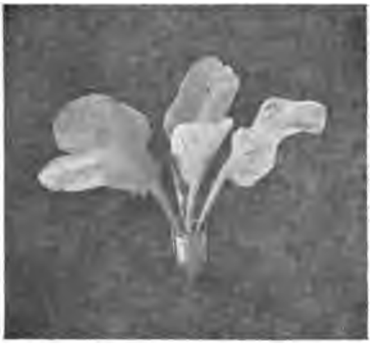

FIG. 399.— CABBAGE PLANT WRAPPED WITH STIFF PAPER AS A PROTECTION AGAINST CUTWORMS

Control. In the home garden cutworms may be caught and killed by hand. They will hide underneath pieces of boards or shingles placed near the plants where they may be found and destroyed.

They may be quite effectually destroyed with a poison bait made of 10 pounds of bran and 1 pound of white arsenic or paris green moistened with just enough water to hold the materials together, after which a quart or two of cheap molasses should be added to sweeten the mixture. A handful of this bait should be placed near each cabbage plant in the evening so that the cutworms will be attracted to it during the night after they emerge from their hiding places.

SQUASH BUG

The squash bug (*Anasa tristis*) is blackish-brown in color on top and specked with yellow underneath. It is from one-half to nearly three-fourths of an inch long and has two long antennæ on the head (Fig. 400-a). On the underside of the head is a long slender beak which constitutes the mouth parts, and with which it sucks up the juices of the plants on which it feeds.

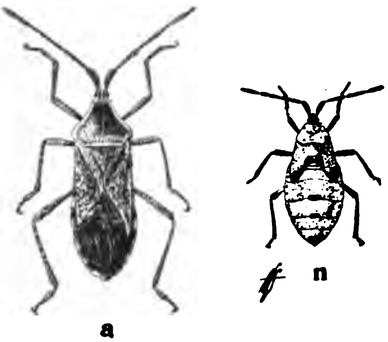

FIG. 400.— THE SQUASH BUG: (a) ADULT; (n) NYMPH

The full-grown bugs hide away in the fall beneath stones, boards, leaves and other rubbish that they may find. In spring they come from their hiding places and begin their search for squash vines. When they find the plants they soon commence to lay their brown eggs on the undersides of the leaves, and sometimes on the upper sides also. Occasionally the eggs are laid in regular rows, as shown in the illustration (Fig. 401). In eight to twelve days small green and black bugs hatch from the eggs. These young bugs are somewhat like the full-grown ones, but they have no wings and are lighter green in color (Fig. 400-n). They are called nymphs and each one has a beak with which it punctures the leaf and

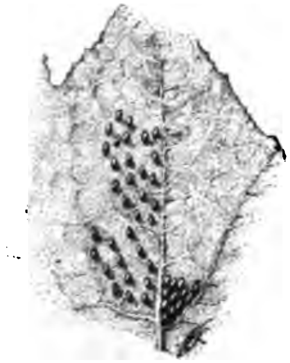

FIG. 401.— EGGS OF A SQUASH BUG ON A LEAF

sucks out the juices. The nymphs grow and shed their skins five times before they become adults. More than a month is usually required for the bug to reach full size. There is only one generation a year.

Control. The full-grown squash bug and the nymphs puncture the leaves of the squash and suck out the juices, thus causing the leaves and finally the whole plant to wither and die. In addition, the bugs may carry from one plant to another a very serious bacterial disease, the wilt, which sometimes causes a great deal of injury.

Poisons will not kill the bugs, but early in the spring one should keep a sharp lookout for the old bugs and catch them by hand before they lay their eggs. A little later the eggs, when laid, may also be destroyed. The old overwintering bugs may be trapped under pieces of boards, bark or shingles laid on the ground. The bugs will crawl under these for shelter and may be caught and killed in the early cool spring mornings when they are not very active.

STRIPED CUCUMBER BEETLE

The striped cucumber beetle (*Diabrotica vittata*) is only about two-fifths of an inch in length. The ground color is yellow above but the head is black, and there are three black lines running lengthwise of the back. The underside of the body is mostly black (Fig. 402).

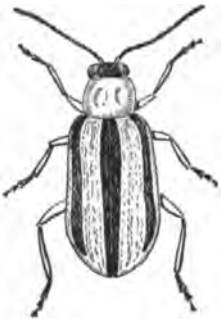

FIG. 402.— STRIPED CUCUMBER BEETLE, ENLARGED

The full-grown beetles spend the winter hidden away beneath leaves and other rubbish, but they appear early in spring and feed on such plants as they can find until the cucumbers and melons are up. After feeding for awhile on their favorite plants they lay eggs in crevices of the soil near the roots of the vines. The eggs hatch into slender, white, worm-like larvæ that live on the roots of the plants and cause more or less injury. In about one month the larvæ change to pupæ and in about one week more the adult beetles appear. In most parts of New York State there are probably two generations a season, while on Long Island there may be three.

Control. In spring the hungry beetles eat the leaves and flowers of the young plants of cucumbers, melons and squashes, and cause severe injury, sometimes destroying the plants.

The plants, at least in home gardens, may be protected by putting boxes, which have been made without tops or bottoms, around them. The lower edges of these bottomless boxes should be pressed into the earth so that the beetles cannot crawl under. The tops of the boxes may be covered with coarse thin muslin, at least until the second or third pairs of leaves appear on the plants.

Another protective measure is to keep the leaves of the plants covered with fine sifted ashes or aïr-slaked lime. The beetles seem to be repelled by the dust.

Probably the most effective protection against these beetles is afforded by spraying the plants thoroughly with arsenate of lead, 2½ pounds to 50 gallons of water, or in smaller quantities at the rate of 4 ounces to 5 gallons of water. Whatever is done must be done thoroughly and often. The new leaves as they appear should be covered with the repellant mixture.

COMMON ASPARAGUS BEETLE

Asparagus, introduced into the colonies with the early settlers from Europe, is said to have had no insect enemies for nearly two hundred years. Now, however, it is sometimes seriously injured by two beetles and a species of fly.

The most serious pest is the common asparagus beetle (*Crioceris asparagi*). The beetle is scarcely one-fourth inch in length, is blue-black in color, with a red thorax, and with lemon-yellow and dark-blue wing covers with a reddish border (Fig. 403). The adults vary considerably in general color, some being darker, while others are lighter. The beetles pass the winter under piles of rubbish, sticks or stones and appear in the early spring about as the asparagus is ready to cut for market. The adults deposit their rather large conspicuous dark-brown eggs on the stems of the aspar-

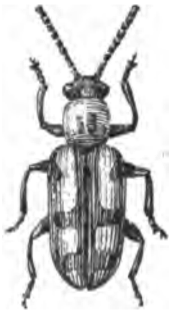

FIG. 403.—COMMON ASPARAGUS BEETLE

agus, often in great numbers. In a few days they hatch and the grubs begin at once to feed on the tender plants. In ten to fourteen days the grubs complete their growth and go down into the earth where they change to pupæ in dirt-covered cocoons. In about one week the beetles emerge, thus completing the life history. Two and perhaps three broods appear in a season in New York State.

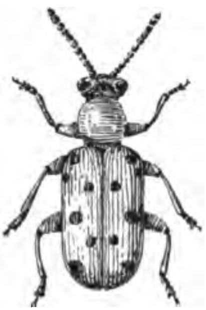
FIG. 404.—SPOTTED ASPARAGUS BEETLE

The other asparagus beetle is known as the twelve-spotted species and does not seem to be as destructive as the former. The chief damage by this species is done by the over-wintering beetles feeding in early spring on the young and edible asparagus shoots. The beetles and grubs that appear later seem to feed entirely on the berries of the asparagus plant.

Control. On small beds of asparagus the beetles may be hand-picked. Destroy all volunteer plants about the beds in order to force the beetles to lay their eggs on the shoots that are being cut daily and sent to market. Spray the asparagus plants after the cutting season is over with arsenate of lead, 2½ pounds to 50 gallons of water. In order to make the poison stick to the tiny branches of the asparagus it would be well to dissolve 2 or 3 pounds of hard soap in the mixture.

POTATO FLEA BEETLE

The potato flea beetle (*Epitrix cucumeris*) is a small insect about one-twelfth of an inch long with a black body and dull yellow legs. Its hind legs which are unusually stout enable this small bettle to jump suddenly when disturbed, like a flea; hence the name "flea beetle." It attacks tomatoes, egg plants, turnips and radishes as well as potatoes.

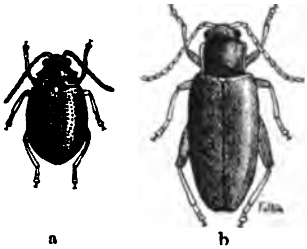

FIG. 405.—TWO COMMON POTATO FLEA BEETLES. *Epitrix Cucumeris* (a) *and Systena Hudsonias* (b)

The adult beetles pass the winter hidden beneath rubbish or under leaves, and appear during

April and May. They may be found upon various plants at this early season, but later they attack the potatoes and injure the leaves by eating cavities in the epidermis on both the upper and under sides. In June or July they lay their white eggs in the soil and the larvae, which are white, slender, worm-like creatures, seem to live upon the fragments of the seed potatoes and later upon the forming tubers. In some seasons on Long Island, at least, the larvæ bore into the potatoes, thereby causing "slivers" to form in the tubers. Moreover, spots or pimples may form on the surface of the tubers where the larvæ

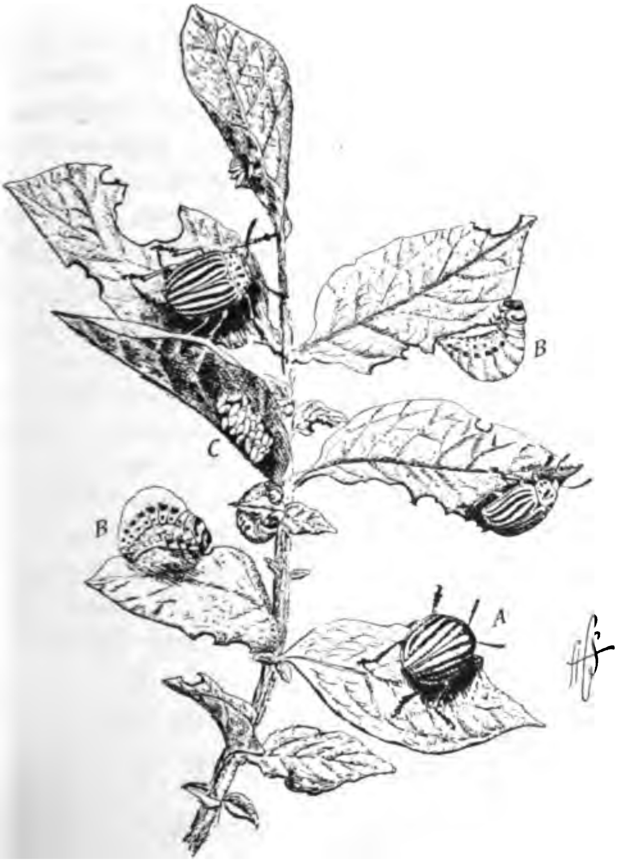

FIG. 406.— POTATO STALK WITH BEETLE AT WORK: (A) BEETLE; (B) GRUB, OR SLUG; (C) EGGS

entered. Such potatoes are said to be "pimply," and buyers take them only at a reduced price. There is apparently one brood, with possibly a partial second in New York.

Control. The principal damage is done by the small flea beetles themselves eating holes in the leaves. This injury is often very serious and hard to prevent.

Although these insects are biting, poisons do not seem to effectively control them. The best method of fighting them is to keep the leaves of the potatoes covered with bordeaux mixture. This mixture should be sprayed on both sides of the leaves as much as possible and it should be applied at frequent intervals at the rate of, at least, 100 gallons per acre. If the Colorado potato beetle is present, paris green may be added at the rate of 1 pound to 100 gallons.

IRRIGATING VEGETABLES IN NEW YORK

PAUL WORK

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PRACTICABILITY

The casual observer in passing through the market gardening sections in the neighborhood of our cities cannot fail to notice lines of pipe supported on posts extending through many of the fields. Unless he happens along at just the right time he will wonder as to the uses of these lines. If he stops to inquire he will learn that each bears tiny nozzles spaced three or four feet apart, and that each is connected at the end with a water supply main. A conversation with the owner of the place will perhaps lead to a demonstration of the apparatus and he will see that these miniature nozzels are capable of applying water to a belt of twenty-five or thirty feet on each side, and that by means of a specially constructed union the whole line can be turned to cast water to cover ground at a considerable distance, in the intermediate space, or directly under the line, the latter being accomplished by means of a vertical throw. The flow is controlled by means of an ordinary globe or gate valve.

WATER SUPPLY

The next question which naturally arises in the mind of the observer is that of the water supply. There are few places where water cannot be had under conditions which would make its use profitable. In some instances a small pumping plant is established by the side of a stream or pond. A three-horsepower engine and a duplex pump is able to furnish 100 gallons of water per minute at a pressure of 30 pounds and at a cost of about ten cents per hour. As different areas can be watered successively, this is sufficient to take care of several acres. Other gardeners sink wells to a deep water-bearing stratum lying below. Some use a number of driven wells connected together. Others use single wells of large diameter which have a great gathering surface.

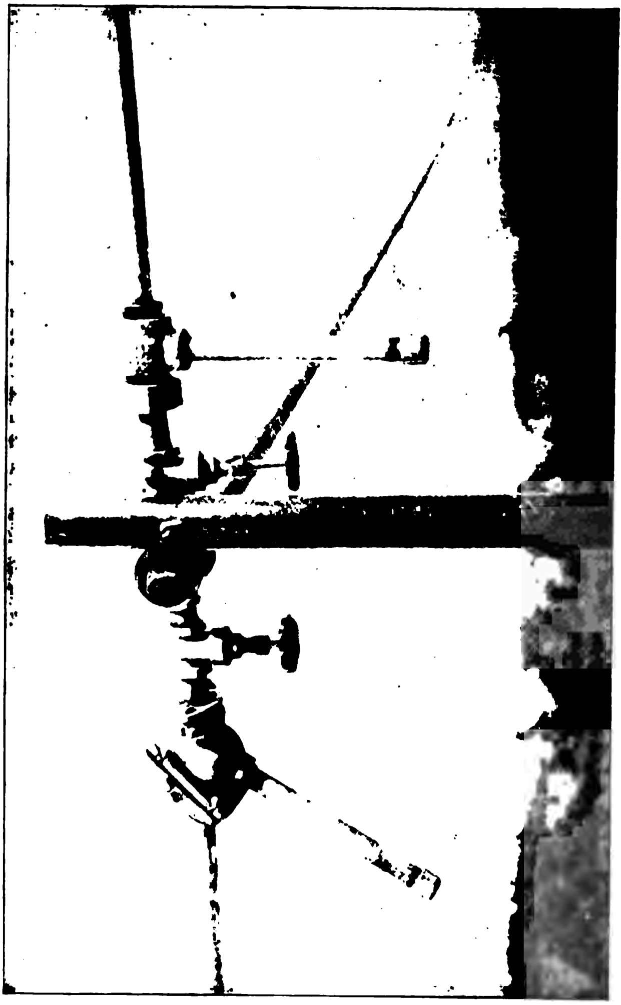


FIG. 407.— WHERE THE NOZZLE LINES JOIN THE MAIN. TWO TYPES OF UNION

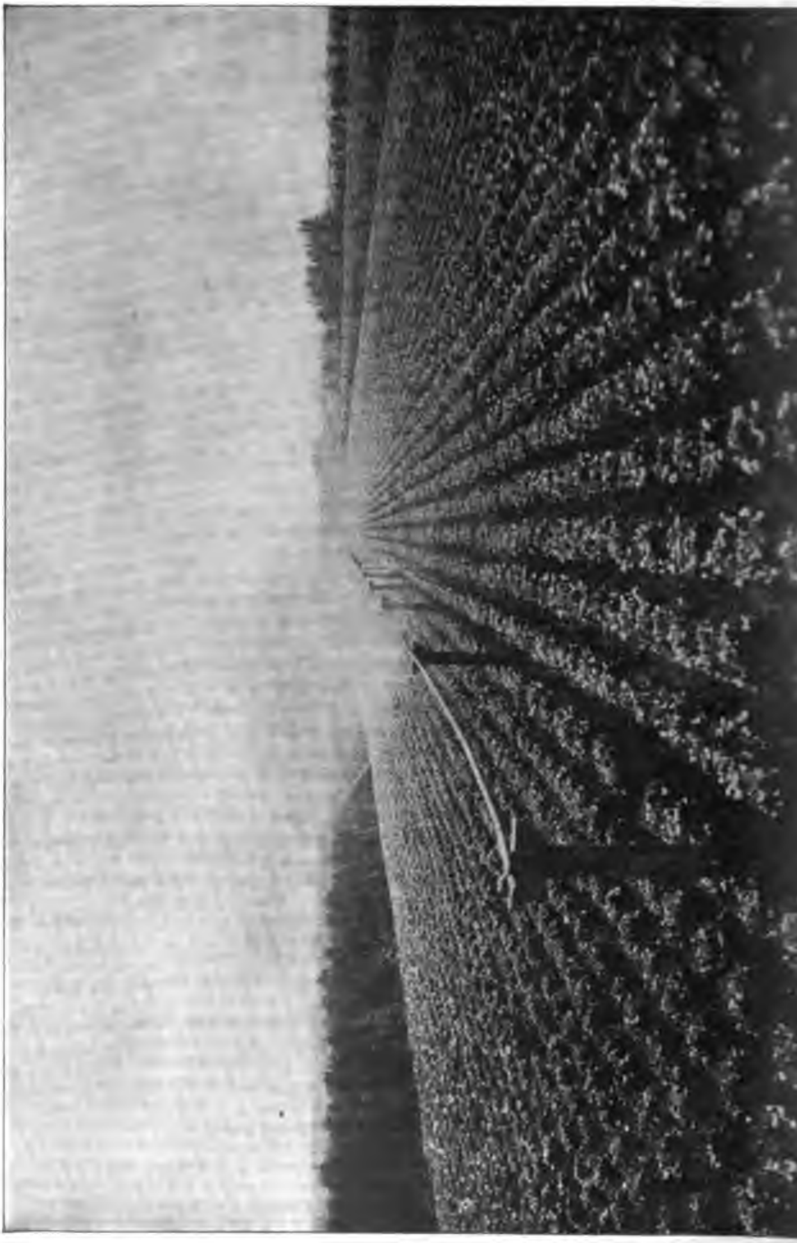
At Rochester a most ingenious method is employed. A concrete ring perhaps eighteen feet in diameter, four feet high and a foot thick is constructed with a sharp lower edge. This is strongly reinforced. The soil is then dug out from the inside and it is allowed to sink as the work progresses. Concrete block are built upon the ring and thus the wall of the well is constructed as it gradually drops into its final place. Radial pipes are usually set in the concrete ring to permit the free inflow of water. If a stream can be dammed at an elevation of about one hundred feet above the gardens the gravity will supply sufficient pressure, a three and one-half inch pipe delivering approximately 100 gallons per minute at a distance of from five to seven hundred feet. An increasing number of gardeners are able to secure city water at such reasonable prices as to make this the best available supply. They take advantage of the rates which are accorded manufacturers who use relatively large quantities.

OVERHEAD IRRIGATION

The management of overhead irrigation apparatus presents some interesting questions. But little real experimental work has been directed along this line and the knowledge of the subject is based almost entirely on experience and opinions of growers. Most users believe that thorough irrigation less frequently is to be preferred to many light applications. Most men water at night or when it is cloudy, but some do not hesitate to use it even in mid-day, believing that the plants are benefitted by the cooling. The work should be so planned that the ground will not be muddy when produce is to be gathered from the field. Precautions must be taken against cracking with such crops as tomatoes and roots. This is usually occasioned by heavy watering after the plants have been kept quite dry. Care should be taken to avoid the development of rots of various sorts, in lettuce especially, as it nears maturity.

DOES IRRIGATION PAY?

We have thus far neglected entirely the important question, does irrigation pay? The very rapid increase in the number of users of irrigation is quite conclusive evidence in its favor. Those who have had experience find it especially helpful when they sow



seed in dry weather, when they transplant plants and as crops near maturity. It always pays to have products to market when the other fellow has none, and judicious application of water will very frequently enable a man to make his regular sales while his neighbors are devoting most of their time to praying for rain. Prices are usually highly favorable at such times.

Viewing the case from another standpoint, we are further convinced of the value of irrigation. The vegetable man invests in land, in labor, in fertilizing material, and any other factors which make for heavy yields. It frequently happens that his return from these investments is jeopardized or lost through his inability to control the moisture factor. He may do much by leaving his land rough through winter to prevent run-off, by harrowing frequently until planting time, by maintaining an effective mulch throughout the season — but even so, through sheer absence of moisture to be conserved, his whole crop may be lost, or so much of it that he might better have left the ground unplanted.

On the other hand, irrigation is not a panacea. It does not relieve the grower of the necessity of good drainage and careful cultivation. The former is a precaution against over-watering by means of his artificial system or by means of heavy rains which may come just after a thorough irrigation. The latter saves water which is costly and helps to keep the soil in better physical condition. The man who invests his money in the improvement of many of the growth factors and then invests more money in irrigation, but who neglects a single additional factor which limits the crop return, is worse off than if he had never heard of irrigation. He loses the cost of irrigation in addition to other costs.

Many growers can give very inspiring figures as to the results they have obtained by means of irrigation. A New Jersey producer has secured yields of as much as six hundred and twenty bushels of potatoes from an acre. The same planter was able to mature a $1,500 crop of onions from a five-acre field in time to permit the setting of a later crop of celery. Another grower reports that an outlay of three or four hundred dollars saved several thousand dollars worth of celery, whereas an unwatered acre and a half was a complete failure. The Ontario Agricultural College reports experiments with lettuce as follows:

Treatment	Maturity Leaf	 Head	Weight of Crop Leaf	 Head	Quality
Irrigated	June 22	July 10	20 lbs. 5 oz.	25 lbs. 15 oz.	Fine
Non-irrigated	July 4	July 26	20 lbs. 3 oz.	9 lbs. 1 oz.	Bitter

The cost of installing irrigation equipment on an acre of ground usually lies between $100 and $150, according to the price of pipe and a man's ability to pick up bargains and to utilize material that is lying around. These figures do not include the water supply, which is, of course, very difficult to estimate on account of the wide variation in conditions.

IRRIGATION BY UNDERGROUND PIPES

Other methods of irrigation are practiced in various sections of the country. About Boston a system of underground pipes is frequently installed which, with fifty feet of hose, will reach all parts of the garden. It costs about $65 to equip the first acre and roughly $50 per acre thereafter. An inch of water (27,152 gals.) may be applied to an acre of ground with an inch and a quarter hose by a single man in five or six hours. This method is not very generally favored on account of the labor and the cost of maintaining hose, and on account of the distribution of plants and danger of injuring the physical condition of the soil.

SUB-IRRIGATION

Where the sub-soil is impervious, or where, as in the case of the muck lands, a high outlet maintains the water table relatively near the surface, it is possible to water by sub-irrigation. On the muck lands this is accomplished by merely blocking the outlet in such a way as to bring the water up a little nearer to the surface. The soil is well saturated, the outlet is again opened and the surplus water allowed to drain off. Of course, this will not work unless there is a small stream flowing into the swamp, though such is frequently the case. At Sanford, Florida, sub-irrigation is practiced by means of a system of ditching almost like that used for drainage. In fact, the same lines may be used for both irrigation and drainage. In this district the water supply is from artesian wells. Surface irrigation is utilized to some extent in the East

The method consists of conducting water along the end of the plot to be irrigated and allowing it to flow into furrows between the rows of the crop. It is best to permit the water to reach the far end of the row as soon as possible and then allow it to be absorbed evenly throughout the land. If this is not done the part of the field next the supply ditch will receive much more water than the remainder. This form of irrigation is useful on level land where there is abundance of water and where the soil is suitable. Light soils drink up the moisture so rapidly that even distribution is difficult.

MARKETING VEGETABLES

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The question of marketing vegetables presents several phases for consideration, for the reason that there are so many conditions under which the production is carried on.

THE HOME MARKET

The problem of the one who lives in close proximity to the town or city in which the product is to be sold, who knows either the wholesaler, the retailer or the consumer to whom he is to sell, and is familiar with the requirements of the market, is much different from that of the large commercial grower, who depends on the markets of the entire country and who does not know at the time of planting whether the demand for his product will come from New York, Boston, Pittsburgh, Cincinnati, Chicago, or possibly be transported over still longer distances to the far southern markets.

The former knows just what his market requires as to type, color or condition of each vegetable. He knows the whims and caprices. He is able to establish a regular trade or to bring his products forth from day to day as the demand requires. He knows where the fancy products will meet with a ready demand, and where the cheaper trade is to be found — to whom he can dispose of his poorer grades. Only when there is a great over-supply is he in trouble.

THE DISTANT MARKET

Not so with the man who is dependent on shipments being made over a wide area. He has a dozen different markets, each with its own peculiar requirements and demands. He has a chance of selling to a local dealer who has no particular interest in either the product or the producer, except to get his margin; or, on the other hand, he can consign to a commission merchant in a distant market, running the many risks which are to be encountered — delay in getting cars; poor refrigeration and consequent loss in hot weather; or freezing if in cold weather; delay in transit and consequent loss; rapid market fluctuation and consequent falling in price during the time the product is in transit, and finally, the dishonesty of the receiver.

A large number of the individual growers prefer to take less and sell to the dealer, letting him assume the risks, which is the better way where there is only a limited number of shipments to be made, for there are always losses, and, unless the shipments are large enough — as in the case of the dealer or large grower who can distribute his losses over a large number of shipments — it is liable to strike rather hard if the loss is very heavy.

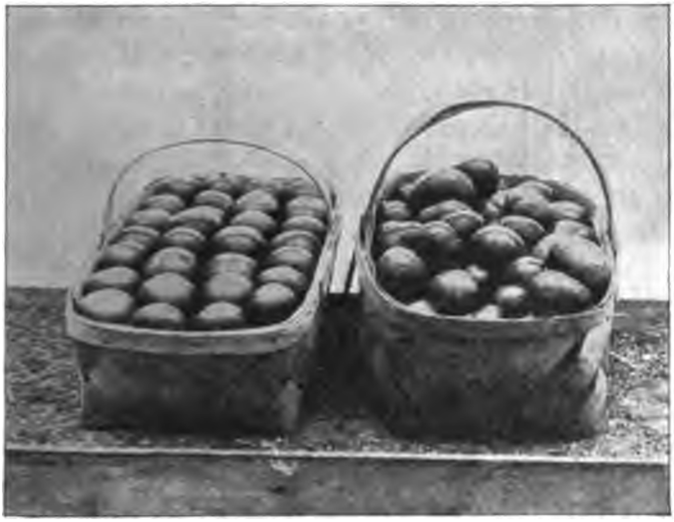

Fig. 409.— A Well-finished and a Poorly-finished Tomato Package

PUTTING OUT A SATISFACTORY ARTICLE

There are a few essentials which should always be taken into consideration in any event. First, that products should always be grown, harvested, graded and packed with a view to satisfying the purchaser. It is comparatively easy to get the purchase money for a product which meets with his approval, but it is dif cult to convince him that the article is worth more to him than h cash, unless it is satisfactory. Second, that the product should harvested at the right time to carry to its destination in good co dition. Third, it should be packed in the package which mee with the approval of the particular market to which it is to shipped.

It should be packed attractively, but never so as to deceive defraud the buyer. It is better to have the contents of a packa prove better than the face rather than poorer. Then it will w reputation and consequently customers. And, understand, t time is ripe for community or collective selling of crops.

The manufacturer who has most nearly reached the acme perfection is he who has specialized in his business. He giv special attention to so producing that he will have the high quality of product at the minimum cost. The man who acco plishes that gives no heed to the disposition of the product exce to learn the public demand so he can meet it.

ADVANTAGE OF COOPERATIVE SELLING

On the other hand, the product is sold by men who are equa as expert in salesmanship, thoroughly acquainted with the mand of every market, with transportation conditions, with trend of prices in the past, and alert to every phase of the scie of distribution of his particular commodity.

It will be said that the vegetable grower is not large enou individually, to carry on this kind of business, except when he close to a special market; but collectively he can accomplish desired results.

The public packing house where the products can be graded well established standards; a system of pooling whereby the casional loss which is sure to occur to every shipper can be tributed over a larger volume of business, thereby becoming o an incident; and finally the employing of special expert salesm will place the grower in a much more advantageous position.

It may be said that this cannot be accomplished except when vegetable growing is done on a large scale, but the tendency where such association work is carried on is to bring about specialization.

The requisites for success along this line are: recognition of the possibilities of the undertaking; absolute honesty of both individuals and association, and absolute loyalty and determination to make the undertaking a success.

VEGETABLE GARDENING AT CORNELL

PAUL WORK
Superintendent and Instructor, Department of Vegetable Gardening, Cornell University, Ithaca, N. Y.

For many years courses in vegetable gardening have been offered at the New York State College of Agriculture at Cornell University at Ithaca. It is only within the last few years that this field has been developed as a specialized branch of agriculture. In October, 1913, the work was commenced as a separate department and the staff now includes four men who are engaged in teaching and one in extension work, beside the gardeners and the office force.

It is the aim of the department to serve the vegetable interests of the state and of the country as far as possible. The prime need at present is for men well trained in practical experience, as well as in technical knowledge, to carry forward the innumerable tasks which lie before us — the solution of the important problems of the field, the building up by well-planned research of a body of fundamental knowledge of matters pertaining to vegetable gardening, and the dissemination of the best that is known through extension teaching, through winter courses, and through courses for regular students. The work at Cornell is being developed in all of these lines. One member of the department gives

FIG. 410.— STUDENTS' GARDEN WORK AT CORNELL

FIG. 411.—SYRACUSE GROWERS VISIT CORNELL GARDENS AT ITHACA, SUMMER OF 1914

his entire time to extension work, attending meetings and extension schools, advising with growers and conducting demonstration trials.

The research side of the department activities, though vitally important, is as yet in an early stage of development. On account of the fact that Ithaca is not in a vegetable producing section and the near-by soil is not typical of that existing in such districts, much of this work will have to be conducted at a distance from the College. It is expected that a man will shortly be appointed to the staff to give his whole time to such studies.

The teaching at the College is planned for regular all-year students, for short winter-course students and for students of the six-weeks' summer school. Most of the courses for regulars are arranged for persons interested in commercial production. The plan for students who wish to specialize in vegetable gardening represents a radical departure from the conventional scheme of winter instruction and summer vacations. It is shaped rather in conformity to the seasons of crop growing. The summer of the first year is spent on a general or a specialized farm according to whether a student has previously had field experience. The spring and summer of the second year is spent with a commercial grower of vegetables. The spring and summer of the third year is devoted to elementary vegetable courses and the fourth season to advanced courses. Thus, in the laboratory work, crops are carried from seed to maturity under the direct daily attention of the students. The vegetable courses include a brief introduction to the subject, a general commercial course, a course in vegetable forcing (producing crops under glass), and a course in the botany types and varieties of vegetables. Ample time is allowed for courses in fundamental science, in associated subjects, such as plant pathology and insect pests, plant breeding, farm management, and others. The student is expected to take such courses in other departments as will give him a broad, general knowledge of agriculture as a whole rather than a narrowly specialized training in a single branch.

Briefer courses are also provided for the student who does not contemplate specializing in vegetable gardening, and for those who are interested only from the standpoint of the home garden.

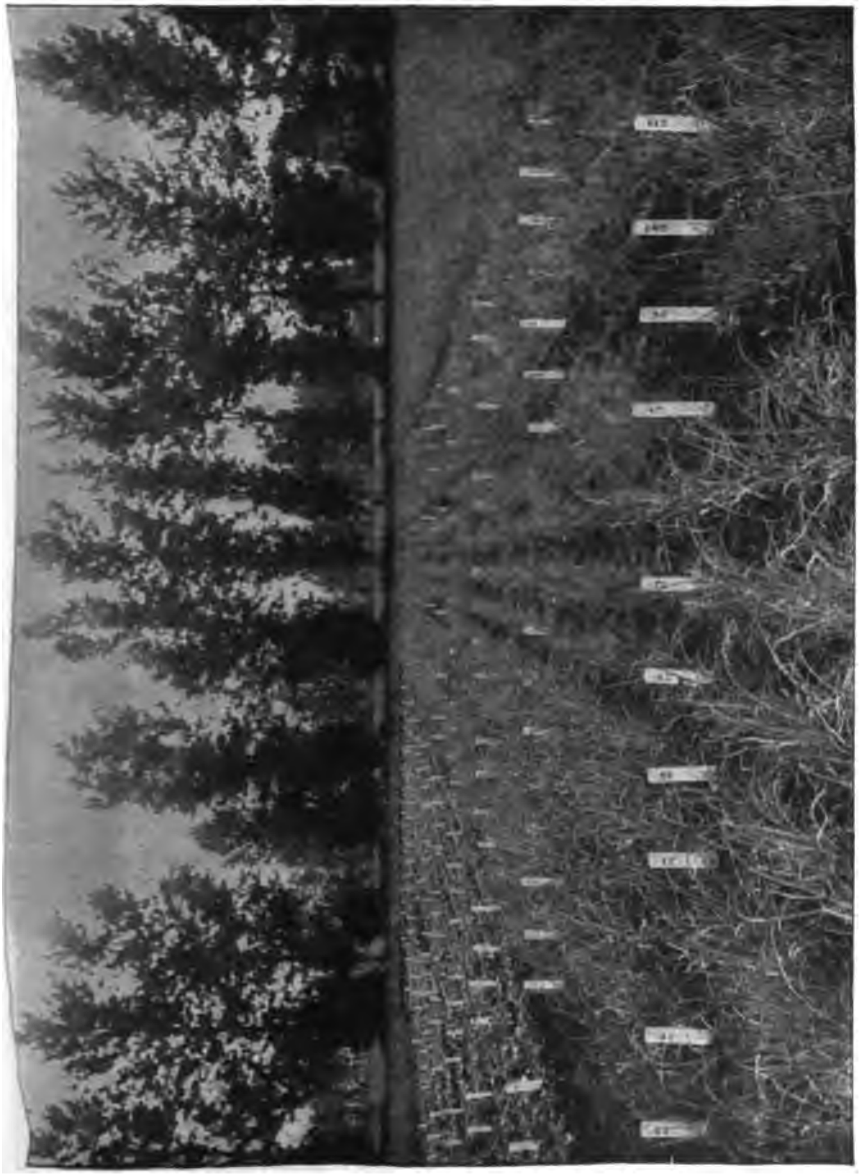

FIG. 412.—A CORNELL COOPERATIVE TEST OF ONION VARIETIES AT CANASTOTA

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The winter course in vegetable gardening has been arrange especially for those who are interested in this kind of agricultur and who are unable to spend the whole year at Ithaca. It i attended by increasing numbers of actual commercial growers a well as persons who expect to enter this field for the first tim The presence in the classes of young men who hail from the various producing sections of the state has added greatly to the interest and value of the work. The plan calls for courses i commercial vegetable production, in vegetable forcing, in soils, i fertility of the land, and in one or two other elective subjects. I is recommended that those who might possibly spend two winter at Ithaca devote the first to a course in general agriculture, an specialize in vegetable gardening the second year.

The department is gradually building up a splendid equipmen for the work in vegetable gardening. Its offices and class room are located in the poultry building. Here are kept the colle tions of preserved specimens, of herbarium material, of photographs and lantern slides, as well as of books, bulletins and periodicals. Four glass houses, comprising about 6,000 square feet o space, constitute the vegetable range at present. This is to b enlarged to about double the area. Adjoining the greenhouses i a frame yard which accommodates at present about 125 sash. Th glass is used for laboratory and departmental work in plant growing and for growing plant crops to maturity.

The gardens include 3½ acres of sandy soil and about 12 acre of heavier land. The former is well adapted for intensive wor and is equipped with service building and with irrigation apparatus, illustrating several types. This garden provides facilitie for the individual student's field work. A half an acre is plante each year with samples of the leading varieties of all the vegetables. The 12-acre piece is divided for a four-year rotation an is utilized for the less intensive types of gardening which ar practiced by the general farmer. The products of the gardens ar harvested and sold, thus giving opportunity for laboratory work i marketing.

THE NEW YORK STATE VEGETABLE GROWERS' ASSOCIATION AND ITS WORK

PAUL WORK

Superintendent and Instructor, Department of Vegetable Gardening, Cornell University, Ithaca, N. Y.

Over four years ago a small circle of New York vegetable men were gathered in conversation in the lobby of the Hotel Secor in Toledo. These men had journeyed from the Empire State to attend the meeting of the Vegetable Growers' Association of America. Within the circle the question arose as to why New York State should not itself have meetings organized on as high a plane as those of the national association. The idea was favorably commented upon and as a result a questionaire was addressed to a number of the commercial producers of the state inquiring as to whether they would be willing to support a state association. Replies were favorable and a call was issued for a meeting to consider the matter of organization. During Farmers' Week of 1911 it was decided to establish such a society and twenty-seven men became members at that time. About as many more men who were unable to be present at Ithaca joined the association within the first few months. From that day to this the growth has been steady, amounting to about 25 per cent. per year. The early months of 1915 point to a much more rapid increase in the enrollment, and the association seems now to be firmly on its feet.

Two features of the development in membership have been particularly encouraging. From the first the membership has included leading growers from every corner of the state, and at present hardly an important producing center is unrepresented. Even more important than this has been the marked development in interest on the part of members. A large number of men are willing to give time, thought and energy to the activities of the organization, and a spirit of solidarity and of willingness to cooperate is developing in a marked degree.

The association began with comparatively few and simple activities. Each year has witnessed the introduction of some new

FIG. 413.— GROUP OF DELEGATES WHO ATTENDED MEETING OF NEW YORK STATE VEGETABLE GROWERS' ASSOCIATION, BUFFALO, N. Y., JANUARY 14, 1915

line of work of prime importance. The work of 1911 was the establishment of the society. In 1912 the seed service was inaugurated. This has developed until it seems necessary that it be reorganized for 1916 in such a way as to take care of the increased business, as well as to include many varieties which are not now listed. In 1913 the first annual report was printed. This records the proceedings of the meetings and so carries the good work of the sessions to members who are not able to be present. The value of this report is indicated by the large number of calls for copies which have been received from institutions and individuals outside of the state. The volume is of nearly three hundred pages and includes a full list of vegetable bulletins of all the experiment stations which are now in print. The association helps members to procure these bulletins which would not otherwise be available to New Yorkers.

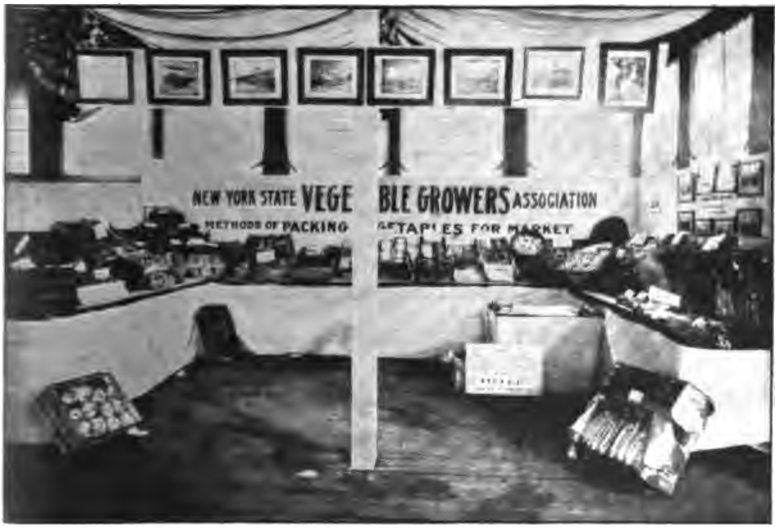

FIG. 414.—PACKAGE EXHIBITS OF NEW YORK STATE VEGETABLE GROWERS' ASSOCIATION AT STATE FAIR, 1912

It has long been the idea of the officers of the association that the meetings of the association should be carried into the local producing centers. In other words, that it is cheaper and easier to carry the speaker to the people than to carry the people to the speaker. Accordingly one day meetings have been held in

Buffalo, Angola and Syracuse. It is probable that many others will be held next year. This was the contribution of 1914.

The prime work for 1915, which is now under way, is the establishment of a crop report service for the benefit of members. Sheets are sent out to all members and these are filled out and sent in to headquarters. This work is under the able and energetic leadership of Professor W. B. Nissley of the Long Island School of Agriculture at Farmingdale.

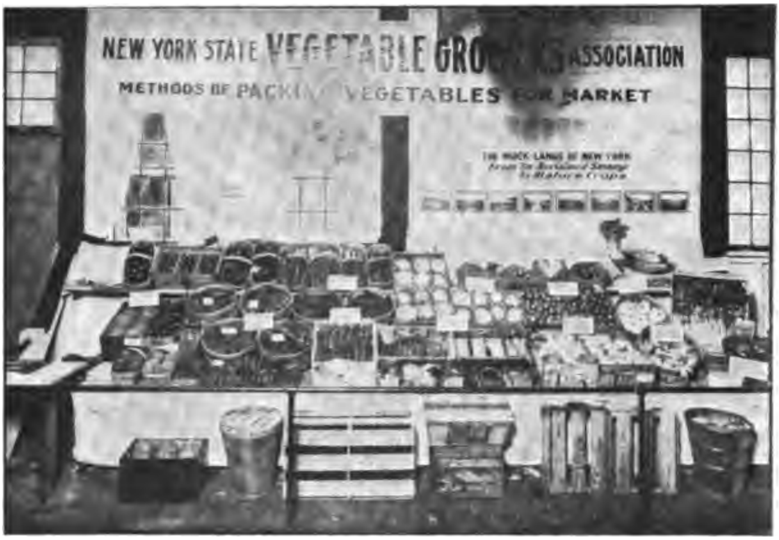
NEW YORK STATE VEGETABLE GROWERS ASSOCIATION
METHODS OF PACKING VEGETABLES FOR MARKET

FIG. 415.— EXHIBIT OF NEW YORK STATE VEGETABLE GROWERS' ASSOCIATION, STATE FAIR, 1913

The Association is also engaged in active work looking toward favorable legislation, better transportation conditions, more and stronger local organizations of vegetable men, better service for growers from colleges, experiment stations and other institutions, and seeking recognition for the interests of the grower in the reorganization of the marketing system which is now in progress. Through the influence of the association very marked improvement has been brought about in the conditions governing the exhibiting of vegetables at the State Fair. The value of the premium list has been doubled, and it is expected that very much better quarters will be available for these displays in the coming year.

The New York State Vegetable Growers' Association was not formed with the idea that it should become a great business enterprise, but rather that its work should be educational and supervisory. It is the aim of the association to do all in its power to further the interests of the vegetable men of the state by disseminating information and by exercising its influence in the interest of progress.

The officers of the association are: President, Henry Greffrath, South Lima; vice-president, S. J. Cook, Dunkirk; secretary, Paul Work, Ithaca; treasurer, C. H. Aldrich, Mattituck.

VEGETABLE GROWERS' ASSOCIATIONS IN NEW YORK STATE

Arkport-Burns Growers' & Shippers' Assn.
    L. J. Taylor, Arkport, N. Y.
Central N. Y. Vegetable Growers' Assn.
    E. E. Smith, Secy., 103 Mill St., Syracuse.
Erie Co. Growers' & Shippers' Assn.
    Chas. H. Houshalter, Secy., Hamburg, N. Y.
Fulton Vegetable Growers' & Shippers' Assn.
    John W. Pratt, Fulton, N. Y.
Ionia Growers' Assn.
    C. R. White, Secy., Ionia.
Long Island Cauliflower Assn.
    C. H. Aldrich, Pres., Mattituck, N. Y.
Long Island Potato Exchange.
    H. R. Talmadge, Secy., Riverhead, N. Y.
Monroe Co. Market Gardeners' Assn.
    A. J. Warren, Secy., Irondequoit.
Newburgh Market Gardeners' Assn.
    Ep. Titus, Secy., Newburgh, R. D.
Rose Vegetable Growers' Assn.
    E. W. Catchpole, N. Rose, N. Y.
Sodus Vegetable Growers' Assn.
    W. E. Danford, Sodus.
South Lima Growers' & Shippers' Assn.
    Chas. N. Pickell, S. Lima.
South Shore Growers' & Shippers' Assn.
    S. J. Cook, Dunkirk.
Troy Market Gardeners' Assn.
    J. H. Pateman, Secy., Watervliet.

EXHIBITION OF VEGETABLES

PAUL WORK

Superintendent and Instructor, Department of Vegetable Gardening, Cornell University, Ithaca, N. Y.

The horse and stock industries have in the past found that exhibitions and exhibiting have accomplished great things for the advancement of the breeds with which they were working. The same statement might be made regarding both fruits and flowers, and furthermore regarding vegetables in European countries, particularly in England. The question at once arises — in what way is exhibition worth while for the individual grower? The chief advantage is undoubtedly in its educational value and in the inspiration toward better effort. One cares to show nothing short of his best. His first problem in preparing an exhibit is, what is the best? In deciding this, he establishes clearly in his own mind an ideal toward which his effort for the whole crop will turn. The second question is: can I not improve my entire crop in the direction of the standard which I am selecting for the fair? Thus his attention is focused upon his cultural methods, upon his seed and his soil, and his market requirements. Thought always means progress. Question three arises when the other fellow gets the prize. What is lacking on my place that I can not do as well? More thought and study is the result, and again, inevitably, progress. The comparison of types on the show bench is also most useful.

Both producing districts and individuals have found that exhibition is profitable advertising. Of course, a " First " is always of intrinsic value, whether for sewing machines, ginger ale, Holstein cattle or garden products. The garden people have not thus far taken full advantage of the possibilities.

Exhibits mean much to the vegetable business as a whole, for the progress of all vegetable growers means progress for each. Slow but steady advance is made toward standardizing types and varieties, in letting the best be known and in raising the ideal of the average grower.

Vegetable exhibits help to educate the public as to the value of vegetable food, as to the variety that is available, and as to the quality which they should demand.

The opportunities which are offered at the State Fair and in the various county fairs ought to be accepted, and where proper facilities are not afforded — as is now emphatically the case at Syracuse — united efforts should be exerted toward bringing about more favorable conditions.

POTATOES *

EDWARD VAN ALSTYNE, KINDERHOOK, N. Y.

Director of Farmers' Institutes

No one can lay down a set of rules which another may follow to the letter, and thereby insure a crop of potatoes or of anything else, for there is always to be taken into account differences in soils, as well as climatic and weather conditions, which prevent any hard and fast adherence to another's methods. Nevertheless, there are with the potato crop, as with every other, certain fixed laws which always obtain, and he who works in harmony with them, rather than from custom or tradition, works with nature, and is more likely to succeed.

Therefore, in calling attention to some of the principal laws which govern the potato — laws which are the same everywhere — I aim rather to help someone to secure a crop with a greater degree of certainty, than to give methods, which apart from the underlying principle may be of little value.

First, then, let us look at the construction of the tuber. It is made up, in round numbers, of 75 per cent. water and 25 per cent. starch. The water — without which in sufficient quantities, and at the right time, it is impossible to obtain a maximum crop — must, of course, come from the soil. The starch is formed by the action of the sunlight through the green leaf. Whatever, then, tends to promote a vigorous growth, and maintain and preserve the leaf surface at its best throughout the entire period of the plant's life, will insure the development of the greatest amount of starch, without which no potato can attain full size or highest quality.

How shall we secure the requisite water supply? If we could control the rainfall, the problem would be an easy one. Unfortunately — or fortunately — in nine years out of ten there is not

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* Revised from Report of Bureau of Farmers' Institutes, 1910. Write for *The Potato Industry in New York State*, Bulletin 57, Department of Agriculture.

enough rainfall during the growing season, from May to October, to produce a full crop of anything, much less a crop like the potato, which is three-quarters water. When one realizes that it requires at least 300 pounds of water to produce 1 pound of dry matter in a plant, and considers the tonnage from even a moderate crop of potatoes (75 per cent. water), and then compares this with the average rainfall in his locality during the above-mentioned period, he will appreciate the truth of this statement. We must, then, secure a water supply from that in the ground in early spring, derived from melting snows and spring rains, at a time when there is little evaporation from the soil; and conserve that from the precipitation during the growing season. This can be done in two ways:

FIG. 416.— POTATO FIELD OF H. F. HORTON, STEPHENTOWN, RENSSELAER COUNTY, N. Y. FOLIAGE IN PERFECT CONDITION AS A RESULT OF INTELLIGENT FERTILIZATION AND CULTIVATION, FOLLOWED BY THOROUGH AND TIMELY SPRAYING FOR BUGS AND BLIGHT

1. By preventing evaporation by frequent stirring of the surface soil. As fast as the ground is plowed in the spring, it should be harrowed or rolled — not left until the whole field is turned over. This will make the soil compact, and prevent loss of water by drying winds, and by breaking up of the capillary cells which quickly form when the ground is crusted, thus making the spaces so large that the water cannot climb to the surface and escape. If the weather is very dry, it is better to roll as fast as plowed, and then

stir the surface. If the land has been fall plowed and one does not intend to replow, as soon as the land will bear a pair of horses and a light harrow, stir the surface. This will not only stop evaporation, but as the air strikes the soil the water will drop down, to be drawn up later when it is needed. Just as in a test tube, the water will not run out so long as one keeps his finger tightly over the top, but remove the fingers and let the air in, and at once the water falls. The same principle of frequent stirring during the cultivation of the crop, until the tops cover and shade the ground, will do more to conserve moisture and insure a crop in a dry season than any other one thing.

2. Plenty of vegetable matter in the soil will help to hold moisture. To illustrate: if we put an equal amount of water in two vessels, but place in one a sponge, and leave them both exposed to the sun and air, we know that from the one containing the sponge we can obtain water long after the other is dry. The vegetable matter has the same effect in the soil. I cannot, in the brief space at my disposal, describe and emphasize the question of soil humus as I should like to, but it is most vital to this crop. That is one reason that I prefer a clover sod for potatoes. I know many prefer "old ground." I am sure this is because the sod is turned in such a way as to leave the soil open, and the sod does not decay. If it is turned on edge with a narrow lap furrow and then compacted, it will decay very fast and be mixed with the soil where it will hold water. Better still, if the sod is thoroughly broken up with a cutaway before it is plowed, the vegetable matter will be incorporated in the soil, and at once decay and feed the plant, and less fitting will be required after plowing. It naturally follows, then, from the above that the ideal soil for potatoes is a loamy one, not so hard or compact that the water cannot readily move through it.

THE SEED

We are accustomed to speak of a "seed potato." Really, there is no such thing for a potato is a tuber, and whatever seed there may be is in the ball on top. When we plant a true seed of grain, for example, although it may come from a weak parent, the pollen from the stronger plants surrounding it overcomes, to a degree at least, the inherent weakness. Hence, such seed selected from the

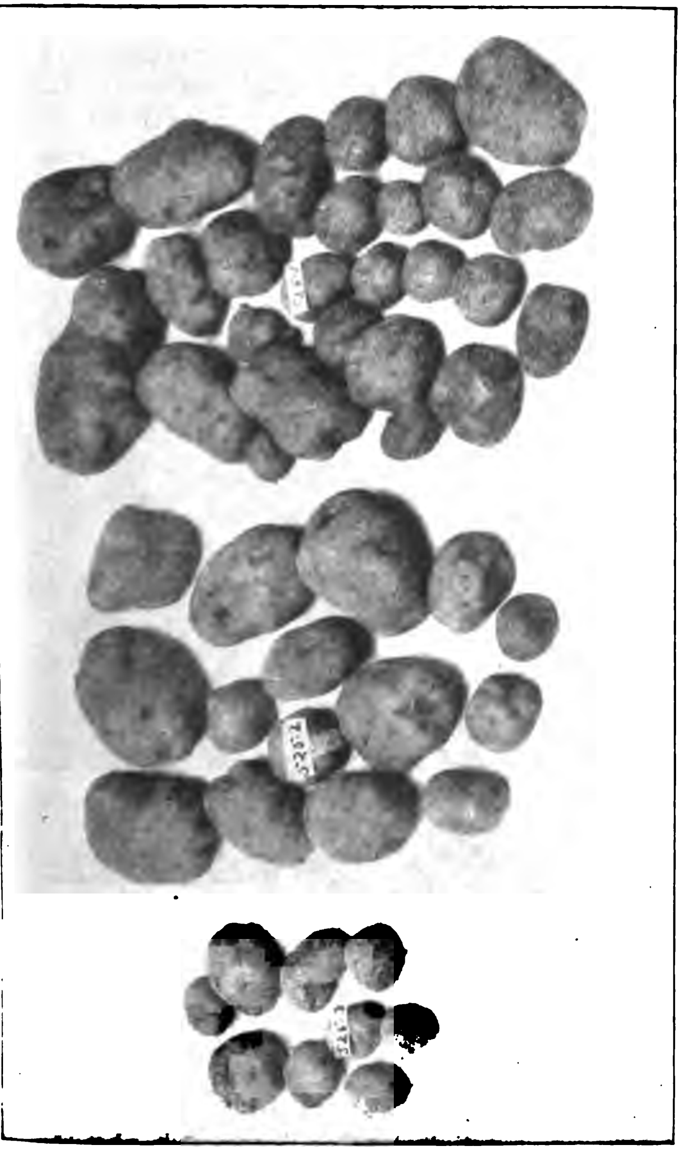


FIG. 417.—VARIATION IN THE PROGENY OF THREE INDIVIDUAL TUBERS OF VERMONT GOLD COIN. SERIES 525-1, IRREGULAR, GOOD YIELD; SERIES 525-2, REGULAR, GOOD YIELD; SERIES 525-3, LOW YIELD

pile by its appearance usually will not deteriorate, but will often improve on the same farm from year to year. Not so with the potato tuber or cutting. If one from a weak hill, with only one or two potatoes, or one in which all the tubers were small, is planted, there must be a deterioration, for there is no cross pollenization from a strong plant to help it. This explains why varieties of potatoes run out, and why people are continually seeking new, strong seed. There are thousands of dollars expended every year for potatoes to plant, many of which come from diseased stock, and few of which are selected, except by external appearance. Most of this money might be saved if the seed tubers were selected from the most vigorous productive hills; not so difficult a task as might at first glance appear, for one can plant a small portion of a field expressly for this purpose, and by digging the potatoes by hand can throw out all hills not coming up to the desired standard. I know two men, in widely separate parts of this state, who had a few years ago — and, for aught I know to the contrary, have now — the Early Rose as productive as when it was first introduced, and they have used only their own seed, potatoes being selected as above.

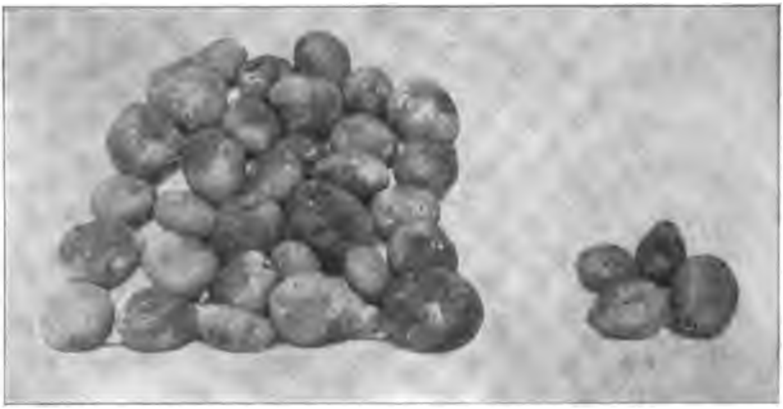


FIG. 418.— SHOWING VARIATION IN THE YIELDING CAPACITY OF TWO INDIVIDUAL TUBERS SELECTED FROM RURAL NEW YORKERS.

A small or medium-sized potato, if it comes from a vigorous productive hill, is a good seed, but the continued planting of small potatoes will mean deterioration, for an increasing number each year must come from hills in which the potatoes were all small.

Anything which impairs the vitality of the seed means less vigor and productivity of the plant. Hence, if the tubers were blighted the previous year, it is probable that the disease is carried directly to the new crop. Of this I shall speak in particular in treating of blight. Again, a field in which the tops were destroyed by blight is one in which, because of the destruction of the leaf, the normal amount of starch has not been formed, and we have an imperfectly developed tuber. If the seed is kept where the sprouts grow long and are broken off there is a loss of vitality. For this reason I prefer to store the seed tubers in pits in the earth so covered with straw that they will not freeze, yet where they keep much cooler than in the ordinary cellar. The same covering will also keep the heat out for a long time in the spring. If one is planting late, after danger from the frost is past, the potatoes can be taken out and spread on a floor where it is light and cool. The eyes will then start slowly, and any potatoes which fail to sprout or which send out a thread-like shoot may be rejected, thus saving vacant or worthless hills.

There is an increasing complaint of damage from scab. This is a bacterial disease, and never the work of insects. The infection may come from the soil. If so, there is no sure way of preventing the trouble. Professor Sirrine, of Riverhead, L. I., has had good results from 500 pounds of sulphur mixed with each ton of fertilizer — using a half ton of the fertilizer to the acre — applied in the drill. A sweet soil is most favorable to the growth of scab. For this reason lime should never be used on land just prior to a potato crop. Wood ashes which are rich in lime have the same effect. It will take at least three years for the scab to disappear from the soil, and in one badly infested, or strongly alkaline, much longer. I have found growers in the Ohio Valley using rye to be turned under before planting potatoes. This makes the land slightly acid and consequently less favorable for scab development.

A frequent source of infection is scabby seed, which can easily be controlled. The old remedy, and an excellent one, is to soak the seed — preferably before cutting — for at least an hour in a solution of 1 ounce of corrosive sublimate to 8 gallons of water, or 1 pint of formalin to 30 gallons of water. This will treat as much seed as it will cover, and may be used again and again. A convenient way is to place the tubers in a sack and suspend it in a barrel or tub of water. After the requisite time of soaking it can be raised up, and the solution will drain back on the vessel, and the potatoes be dry to handle. Both of the above disinfectants are poison and should be handled with care. Where a large quantity of seed is to be treated, the above method takes a great deal of time.

Much advice has been given as to how small a piece of potato to plant. No one can lay down any ironclad rule, but the underlying principle must be taken into account. From the standpoint of economy, one cannot ordinarily afford to plant whole potatoes, and one too small to cut is too small to plant. The number of eyes in the seed piece depends on the type of potato, and the condition of the soil in which it is planted. Two strong eyes are enough, if they grow. The flesh about the eye sustains it until it can root and be sustained in the ground. A potato of the Early Rose type, with many eyes, will have less flesh about four or five eyes than one of the Rural type, with a few eyes, will have about one or two. Hence, the latter can be safely cut to a less number of eyes than the former. If the soil is moist and fertile, the roots will obtain a feeding place much sooner than if it is dry, hard and sterile. This, too, must determine the size and number of eyes.

DEPTH OF PLANTING

The potato requires coolness and moisture. If the planting is shallow it means, sooner or later, heat and dryness. Hence, rather deep planting, 4 or 5 inches, is to be recommended, because it is according to the law of the plant. No one ever saw the tubers form much below the seed piece. Planted shallow, they must of necessity form near the surface. To prevent drying and burning, they must then be ridged up with earth taken from between the rows, cutting off many feeding roots, and leaving a cone-shaped hill which sheds water, and a depression which carries the rainfall to the lowest part of the field, where it is least needed. When planted deep, the tubers have a chance to form in the more moist soil, little ridging is necessary, and the summer rain penetrates to the roots about each plant. Those who plant early will contend that potatoes planted deep will be longer coming up, and the crop will not be as good as if they were planted more shallow and afterward ridged. This is true, yet the principle obtains. Early in the season the ground is cold and has an overabundance of water. If planted and covered deep, it will take a long time for the sun to penetrate to the tuber. Hence, they sometimes fail to come up at all, or are too late for the highest price. If, instead of covering deeply all at once, just enough of the warm surface earth is put on to keep them from chilling, the sun will warm and start the eyes. After a few days put on, with a harrow, a little more earth which has also become warm, and repeat the process until the ground is level, when the potatoes will come up quickly and be strong. At the same time one has cheaply stirred the ground, retaining the moisture, and destroying countless weeds just as they were sprouting.

Except in very foul ground, on which it will seldom pay to plant potatoes, the best yields are obtained from drill, rather than from check row planting. More hills can be put on an acre and there is less disturbance of the roots by late cultivation when this is done only one way.

FERTILIZERS

How much fertilizer and what kind to use, depends largely on the soil. If one has a clover sod, that will help to supply nitrogen, and the decaying vegetable matter will emit acids which help to liberate mineral plant food. In this case it will not be necessary to supply so much commercial fertilizer, particularly nitrogen. It is important to remember that nitrogen in organic matter, such as the decaying sod, manure, tankage, fish scrap or the like, will not become available until the ground is warm. Hence, for early potatoes, or where one depends in part on the sod, I would use nitrogen in the form of nitrate of soda. This is available at once, and for every 100 pounds of nitrogen applied, 63 pounds are found in the plant, while from organic sources, not more than 41 pounds in each 100 pounds applied. For this reason I believe it economy, when nitrogen must be purchased for later growth, to use nitrate of soda. making a second application just before it is needed. If a larg amount is applied at one time, early in the season, much may b lost through leaching before the plants can use it. The danger o such loss will be reduced in soil full of humus.

When manure is made on the farm and is applied to a so in the late fall or early winter, so that it is broken up by th frost and rains, there is little damage from rot or disease whic may occur with manure applied just before planting. This wil usually supply all the nitrogen needed, and all that need be purchased is phosphoric acid and potash. I have had excellent results from 1,800 pounds of South Carolina rock and 200 pound of muriate of potash. This will analyze about 12 per cent. o phosphoric acid and 5 per cent. of potash. We hear much of th need of a large amount of the last named for potatoes, and man potato fertilizers contain as high as 12 per cent. For muck soil and those deficient in minerals this is doubtless none too much but for most New York soils which are high in potash, all the evidence goes to show that from 4 per cent. to 5 per cent. is ample In a few cases larger amounts have given better yields, but whe the cost of the extra amount was figured out the increase did no pay for the extra outlay. All recent experiments show tha phosphoric acid is a controlling factor. Of this there should be surplus which will not be lost, but is available for subsequen crops. In a dry time the soluble phosphoric acid tends to rever or lock up. When rain is lacking until late in the season (whic will make the plant food again available), if there is a minimum of this food, not enough will become available in the short time i which it is needed.

A very good potato fertilizer for ordinary soil, when one applies all three at planting time, can be made from 400 pounds o nitrate of soda, 200 pounds high-grade tankage, 1,200 pounds o South Carolina rock and 200 pounds of muriate of potash. Thi will analyze 3.7 per cent. nitrogen, 9.4 per cent. phosphoric aci and 5 per cent. of potash, and, if the chemicals are purchased should cost not over $28, including mixing. In the season o 1915, with the scarcity of potash, and consequent almost prohibitive price, ordinary directions relative to potash are non-effective

In many cases, from an economic standpoint, potash may be left out or reduced to the minimum. I would pay no more for potash in the sulphate form for potatoes than for the muriate. In spite of the contention that chlorine in the latter will give the tubers a strong flavor, all tests fail to show any difference, even when an excessive quantity is used. The amount of fertilizer per acre will depend on the condition of the soil, usually not less than 500 pounds in combination with manure, or on very fertile soil, or with a clover sod. When these are lacking, 1,000 pounds seems to be the most profitable amount. True, many use as high as 2,000 pounds and claim it pays. Professor Sirrine has made exhaustive tests on Long Island soils, extending over a period of years, with the following result with potatoes at 50 cents per bushel. Had the price been higher the larger quantity might have paid.

Fertilizer	Cost	Increased yield per acre	Money gain
500 lbs.	$ 6.25	23.3 bu.	$ 5.40
1000 lbs.	12.50	44.3 bu.	10.60
1500 lbs.	18.75	55.4 bu.	8.97
2000 lbs.	25.00	61.4 bu.	5.70

My own practice has been, when using only 500 pounds, to apply it all in the drill; with a larger quantity, the balance broadcast, because the feeding roots extend all through the soil. This seems logical. Further, if a large amount is put close to the seed, and heavy rains follow planting, there is often injury to the seed. Hence, it is always wise to mix the fertilizer with the earth.

PRESERVATION OF THE GREEN LEAF

Anything which destroys the leaf surface reduces the starch making machinery, and though there may be an abundant water supply, ample available plant food of the right sort, and greatest vigor of plants, if the leaf surface is impaired or destroyed, all will be for naught.

INSECTS

In many sections the flea beetle is very destructive, but where bordeaux is used the damage has been very slight. Not that it kills the beetles, but being very distasteful it drives them away, perhaps to feed on something less valuable, or it may be they starve.

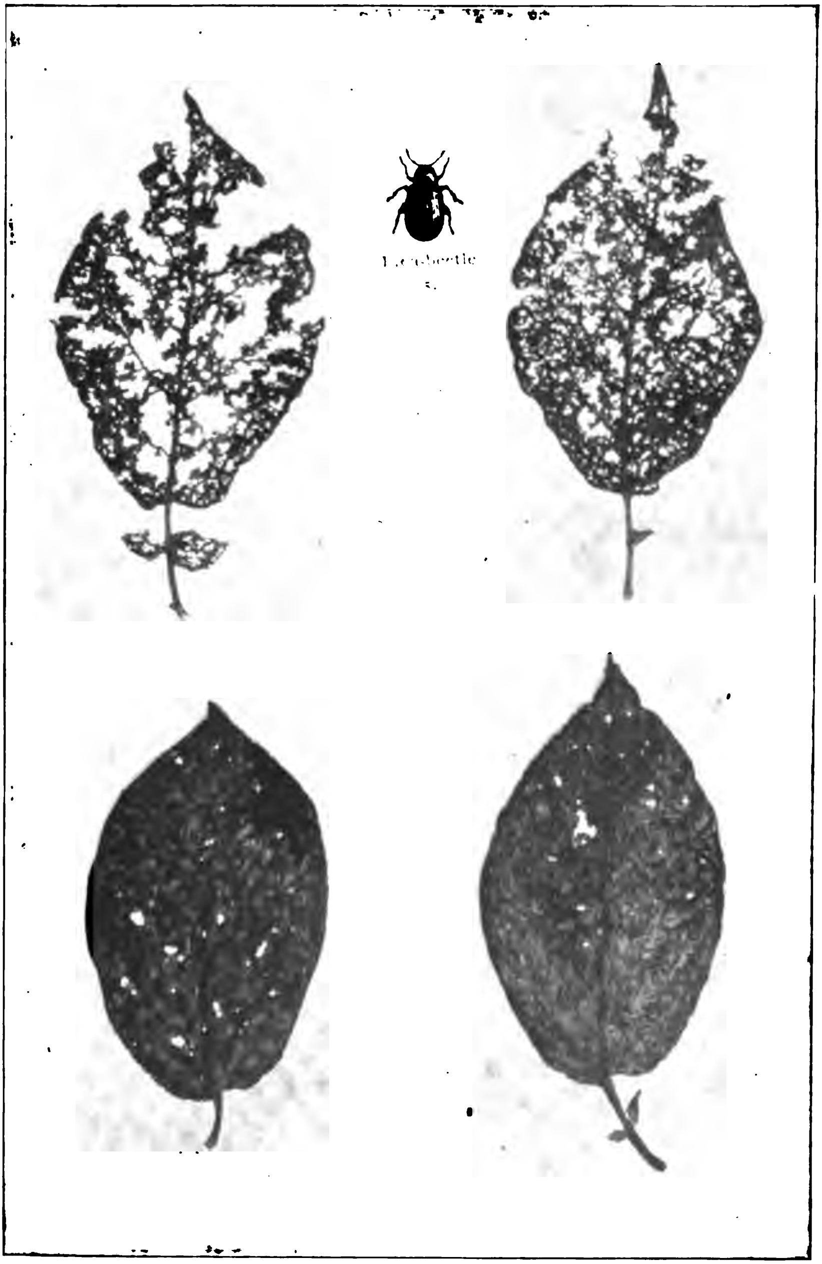


FIG. 419.— THE POTATO FLEA BEETLE AND ITS WORK. UPPER LEAFLETS FROM AN UNSPRAYED PLANT, LOWER ONES FROM A SPRAYED PLANT

Like the poor, the Colorado potato beetle is ever with us, and, although there is an occasional year when they do little injury, the following year is likely to see them abundant. If left unmolested, they will often, in forty-eight hours or less, so defoliate the plants as to reduce the yield below the point of profit. This emphasizes the importance of putting the poison on in time. Often a very little, just as the old hard shells appear, before they deposit their eggs, will prevent further injury. The old stand-by has been, and in many places still is, paris green. This has many objectionable features. First, the arsenic is soluble and the foliage is burned by it. I am sure we have suffered more than we have realized from this. Professor Jones, late of the Vermont Ex-

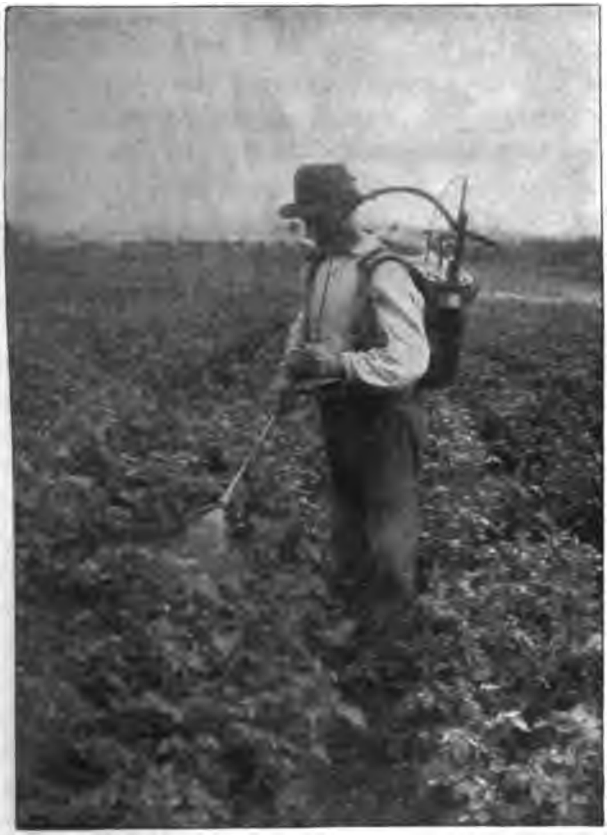


FIG. 420.— SPRAYING POTATOES WITH A KNAPSACK SPRAYER

periment Station, once told me, that 50 per cent. of the potat leaves sent to him for examination for blight had simply paris green injury. Next, being in the form of an amorphous powder, i washes off quickly, and if applied before the bugs are wel hatched out, the application must be repeated, materiall increasing the cost. With these facts before us, I recommend arsenate of lead. This will not injure the foliage in any quantity. It is in a paste form and will adhere a long time Hence, it can be put on with impunity when the bugs firs appear, and it will remain for those hatching later. It is no so quick in its action as the green, and many who have tried i have complained that it did not kill the bugs. This was my own experience the first time I used it, waiting until the bugs were abundant and applying it with a sprayer which did no thoroughly cover the vines. Since I have learned to use it a the first appearance of the bugs, and apply it in such a way tha every leaf is covered, I have frequently found one application sufficient for the season.

Arsenate of lead is sold on a guaranteed analysis of the arsenic oxide it contains. Therefore, one can readily determine its commercial value, and also how much to use. If, for instance, 1 pound of paris green — which should be 50 per cent. arsenic — to 50 gallons of water has been found sufficient to kill the bugs, one should use 3½ or 4 pounds of the lead to a like amount of water or bordeaux.

DISEASES

A disease which does much injury is "tip burn," often mistaken for blight, but entirely different. The life history of this has not been thoroughly worked out. One theory, and to my mind a very plausible one, is that when the early part of the season is wet and the plants heavily fed with nitrogenous fertilizers, a rank rather soft growth follows. Later in the season it turns dry There is more plant than can well be supported, and the extremities of the leaf, farthest from the source of supply, and being only imperfectly nourished, is easily affected by the disease germ which the more vigorous parts of the plant resist. Bordeaux i a good remedy, but it must be evident, if the above is correct, tha an abundant water supply and plant food are conditions which make this disease less likely to occur.

BLIGHT

Taken altogether, the most serious foe to the potato is the blight. It is so insidious in its attacks that if preventive measures are not employed early in the season it will often ruin a potato crop in twenty-four hours. The late blight is the one most in evidence and most destructive. It is peculiarly a wet weather disease, the spores of which, so far as is known, live over winter only in the old tubers. When such infested tubers are planted and the earth becomes warm and moist, these spores multiply and burst from their cells, so that the soil literally swarms with them. Many, of course, die; some find their way to the surface. Often, when the plants are five or six inches high, a heavy rain will beat them down to the earth where they come in contact with the blight spores. If the weather continues wet, these multiply and penetrate the leaf. Later they spread to other leaves and live on the leaf tissues. When weather conditions are favorable, i. e., wet, they increase at an enormous rate, and so destructive are they that a field will often turn black in a day. If the wet is excessive, these spores are washed from the tops to the ground, and so to the tubers again, and rot often follows — always infection. Here is another reason for deep planting. Tubers are less exposed to the spores and being deeper and cooler in the spring, fewer spores germinate and come to the surface. There is no cure after the spores are established, but it can be prevented by what is known as the bordeaux mixture, viz., 5 pounds of copper sulphate (blue vitriol), 5 pounds of lime and 50 gallons of water. If this is thoroughly applied early, before the leaves are contaminated, it copperplates them, as it were, and the blight spores die because they can not gain an entrance. It must, therefore, be applied in season, thoroughly, so as to protect the whole plant, and often enough to cover the new growth. Sometimes one spraying before the spores come from the ground has been sufficient. Usually three give excellent returns. Again, five are even more profitable. Much depends on the season, as well as on the time and thoroughness of the work.

There is no question as to its practicability, in proof of which I call attention to Bulletins No. 323 and 349 of the New York State Experiment Station, which may be had for the asking. Briefly stated, the facts are these: For seven years the station

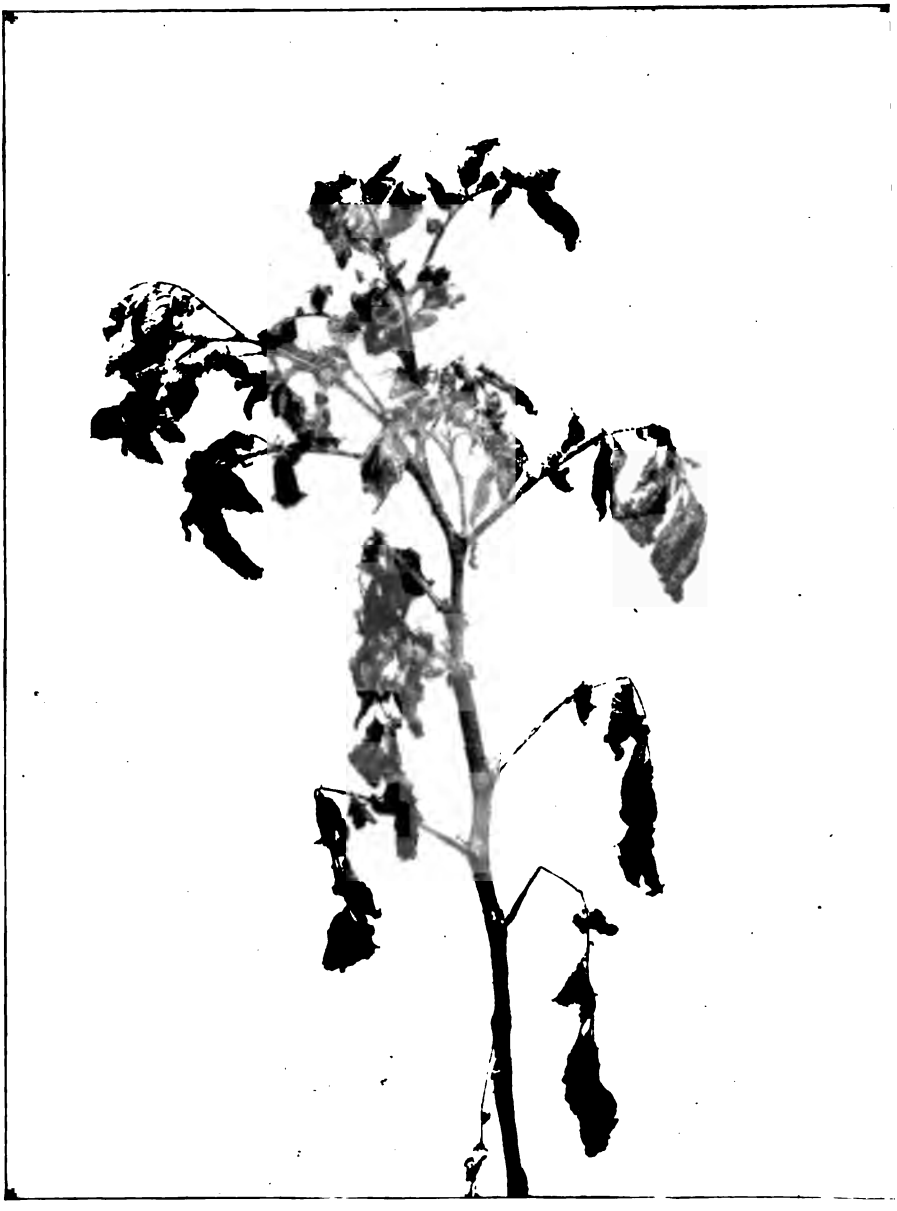


FIG. 421.— POTATO PLANT ATTACKED BY LATE BLIGHT

has been carrying on cooperative experiments with farmers scattered from one end of the state to the other. The farmer does the work according to his own method, the station provides for proper check rows, and assists in measuring the areas and weighing the product. The grower keeps accurate account of all expenses and profit or loss from the spraying. During the seven years the average cost of spraying an acre has run from $4.15 to $5.90. The increased yield per acre has been from 18.5 bushels to 62.2 bushels and the net profit per acre from $8.53 to $24.86. This is the average highest and lowest return from all the experiments in different years. The greatest gain, of course, has been in years when blight was severe, the smallest being in 1908, when there was scarcely any blight. Doubtless, much of the gain that year was due to decreased damage from flea beetles because of bordeaux applications. The average increase in yield per acre for the entire period was 44.1 bushels, with an average net profit of $16.77 for the seven years. At Geneva the gain per acre due to spraying every two weeks was 97.5 bushels; at Riverhead 45.7 bushels. The gain due to spraying three times at Geneva was 69 bushels; at Riverhead 25 bushels.

Few appreciate the fact that the potato makes its most rapid growth in the last two weeks of its life. If the green leaf, then, is impaired or destroyed before the plant has lived out its natural life, the yield may be so decreased as to do away with the profit altogether, or the increase by preserving it by spraying, after paying the expense, is clear gain.

RECAPITULATION

To briefly summarize and emphasize the foregoing it is apparent:

1. That humus well mixed with the soil, and frequent surface stirrings of the same, will materially help to store up and retain moisture or a water supply against the period of greatest need, when the tubers are forming and the tops are evaporating water most rapidly.

2. That deep plowing and planting and non-hilling in ordinary dry seasons will all tend to the conservation of moisture.

3. Strong, healthy seed, in well-tilled soil, with an abundance of available plant food of the proper kind, promotes a vigor of both top and tubers, which will resist disease much better than a weak plant.

4. To insure the greatest development of starch the leaf surface must be preserved until the potato has completed its life cycle.

Surely, then, a line of procedure most in harmony with the laws of nature governing the potato plant will be most likely to insure a crop.

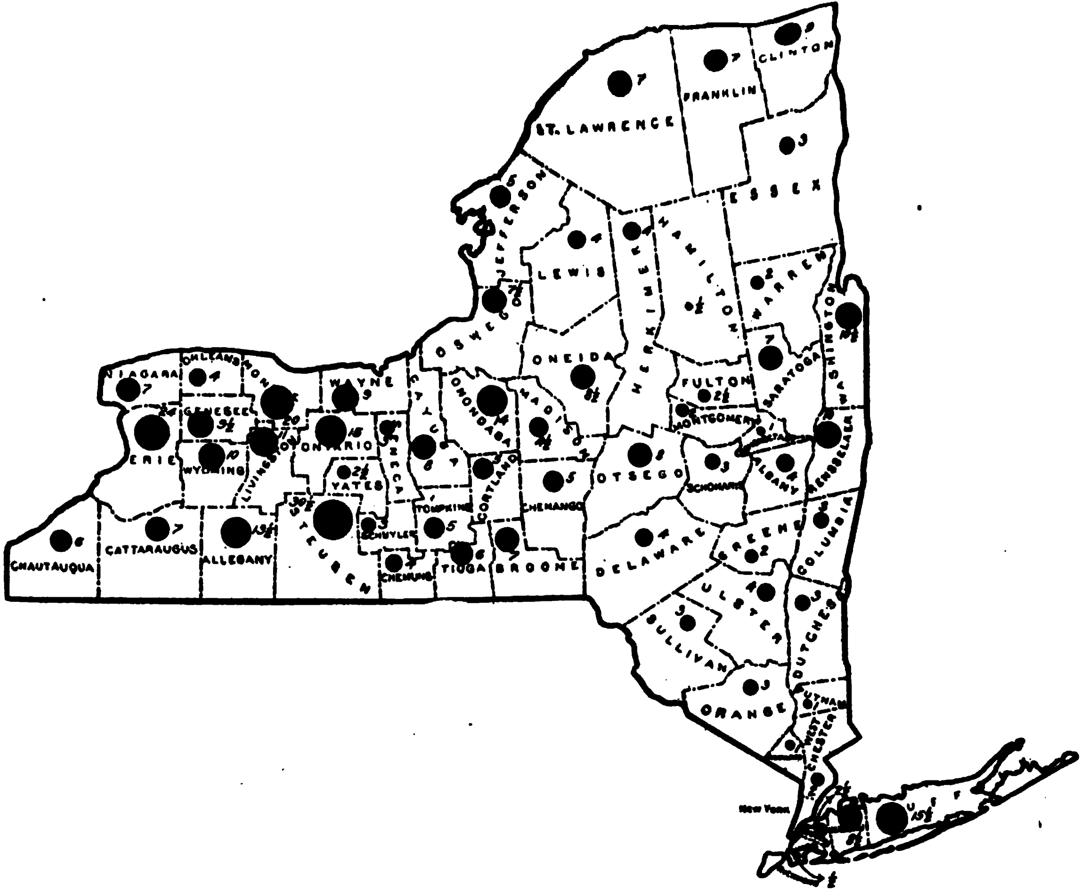


FIG. 422.—MAP SHOWING POTATO ACREAGE. FIGURES IN COUNTIES REPRESENT ACRES BY THOUSANDS.

ONIONS

W. H. Ellis, Livonia, N. Y.

This article will be confined to the onion business as conducted by the growers of South Lima, N. Y.; the fundamental principles are the same everywhere.

THE SOUTH LIMA ONION LANDS

Some thirty-five years ago there was a swamp of about seven hundred acres located at what was then called Hamilton Station, now South Lima, which for sanitary reasons was drained. Soon some of this land was used for the purpose of growing broom corn, willows, etc. Finally onions were tried on a small tract and the result was so satisfactory that South Lima muck sprang into prominence as an onion producing section, and has held a leading place ever since. The entire seven hundred acres have been cleared and nearly one-half of it is annually devoted to the cultivation of onions.

VARIETIES

The varieties presented by seed houses are many but by a process of elimination have been reduced to very few. Ten or twelve years ago, growers usually sowed an equal amount of red and yellow seed. Sometimes the red sold better than the yellow, sometimes the reverse. But at the present time there seems to be almost no demand for the former; the yellow variety is grown almost entirely. It is said that one reason for the change is that the Jews, who are among the largest consumers of onions, never buy red ones.

The Yellow Globe Danver is a popular variety and for early maturity is probably the best. The Ohio Yellow Globe is also good and perhaps will yield more bushels to the acre than the other varieties, but the Southport Yellow Globe is the most generally grown here.

The Danver and the Ohio are slightly flattened at the top. The Southport is almost a perfect sphere, with an extremely small neck, and is a good keeper.

SEED

Where to obtain the best seed is a question which puzzles every grower. Every catalog will claim that the seed it advertises is the best, or at least as good as any, but every year some one is taken in by a house selling onion seed of poor quality. Sometimes a firm will sell seed which will grow onions of as many different colors as Joseph's coat, and if one looks at the package in which the seed came he will find this legend, "This company gives no warranty, expressed or implied, in regard to its seeds."

The best way is to grow one's own seed. When securing onions, carefully select the best bulbs, choosing for color, shape and size. From a bushel of bulbs will often be gathered three or more pounds of seed.

By putting the seed in a tub of water and throwing away all that does not quickly sink to the bottom, only the good is saved.

The seed grown by a South Lima man, tested at New York State College of Agriculture a year ago with seed from several of the largest seed houses, was found to be the best.

Five pounds of seed that will test 80 per cent. or better should be enough for an acre. It used to be said that one ought to sow at least six pounds in order to have some for maggots and other troubles that are sure to beset the crop, but the smaller amount is more in favor now.

FERTILIZERS

After the seed question comes that of fertilizer — certainly an important one.

The onion is a gross feeder and plant food must be supplied in liberal quantities. It should be a kind that is quickly available. A high-grade fertilizer with 4-8-10 analysis is a popular brand, though some prefer to use 2-8-10. In either case about a ton to the acre should be sown broadcast before the seed is sown. Some prefer to sow but part of the fertilizer then and the balance later in the season when the onions are one-half or two-thirds grown. If the season is a dry one it is doubtful if the crop derives much benefit from the late sowing.

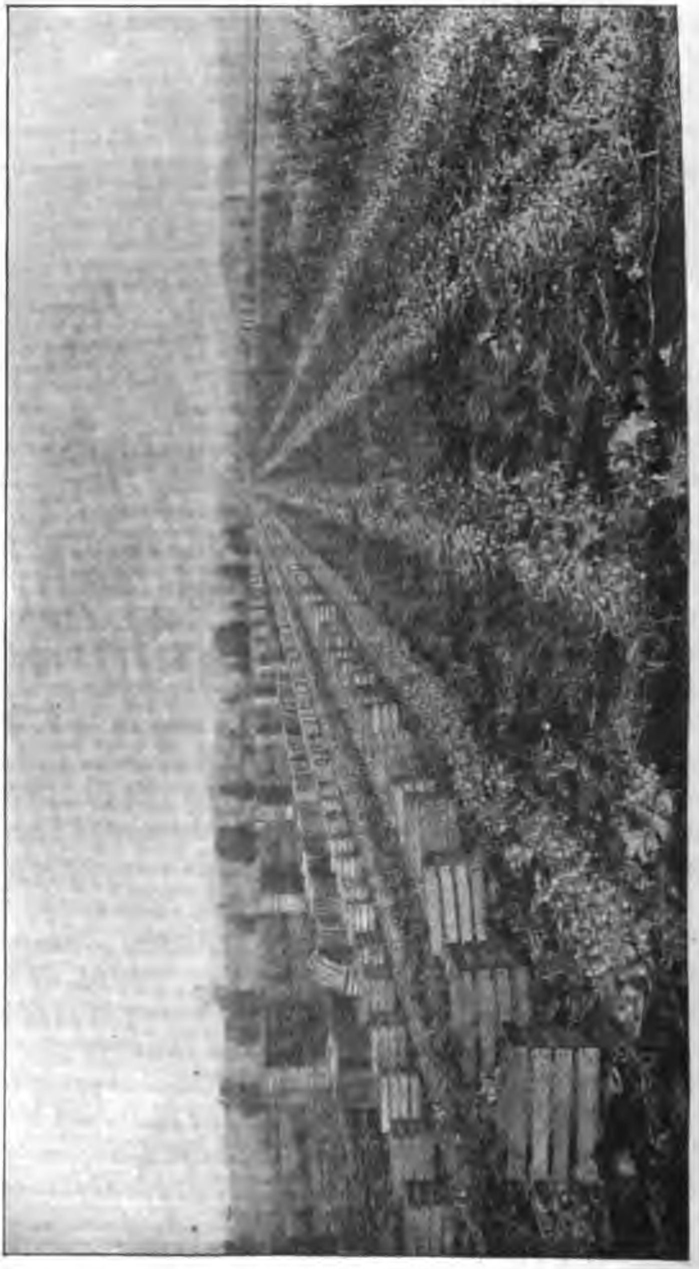


FIG. 423.—CRATES READY TO RECEIVE THE ONION CROP

Good results are often obtained from sowing nitrate of soda in the middle of the summer if there happens to be a wet period.

If a second application of fertilizer is to be made it is a good plan to use a disc just before sowing the fertilizer, which will leave a little trench on each side of the row; then, with the hand fertilizer machine, sow the fertilizer in the trench. If this is followed by a mulcher (a machine that looks like a small lawn mower) the ground will be leveled and the fertilizer will be deep enough for the moisture to make it quickly available.

FITTING THE SOIL AND CULTIVATION

As soon as ground can be worked in the spring is the time to begin fitting for onions. It is a good plan to have the plowing done in the fall. Some fit the land on which late celery was grown the previous year, without plowing at all.

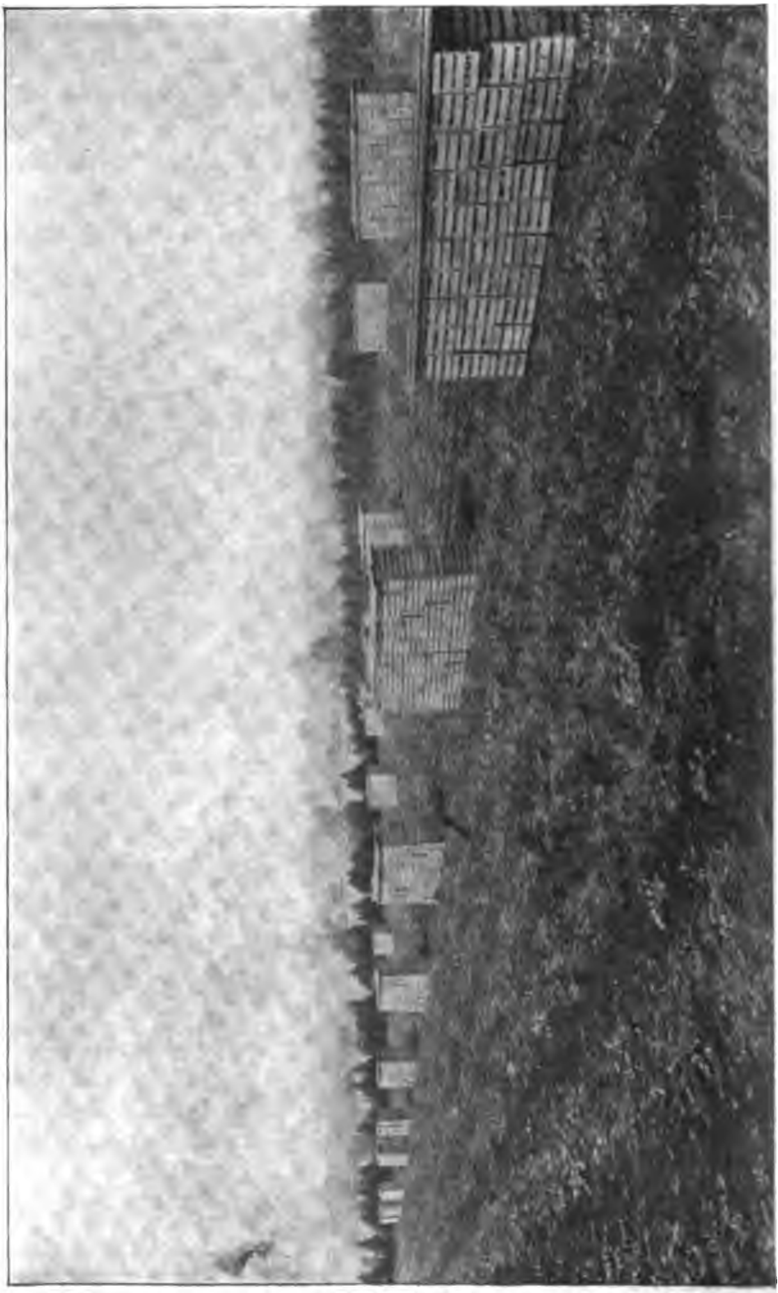
A spring-tooth harrow followed by an acme and that in turn by a float will make a bed of muck land in splendid condition and ready for the seed. With a Planet, Jr., or Iron King drill there should be little trouble in getting the seed on evenly.

The drill should be set so as to sow about one inch deep with rows fourteen inches apart. There is a great tempation to make the rows closer but they are much harder to work. As soon as the little onions begin to show above the ground, work should begin.

Several makes of weeders have been put upon the market in the last two or three years that have been a great help. Some growers still look askance at the manufacturers claiming that any machine that will destroy a weed will not tear out a tender little onion. It is true that they will destroy some, but the difference in cost in going over a field with a weeder and of weeding by hand will more than compensate for the onions that are killed.

Hand weeding is what makes onion growing so costly. Hand weeding has to be done three or four times, but with the judicious use of a weeder this can be reduced to once or twice. Weeding should be followed by almost constant work with the cultivator until the onions are quite large.

The onion is a surface crop and care must be exercised not to cut the roots when the plant has grown large enough to send them out of the row. For this reason a shove hoe is probably the best



tool to use in performing the last work in an onion field. The disc and wheel cultivator go too deep, while a shove hoe in the hands of a careful man, need only skim the surface.

HANDLING THE CROP

About the first of August the neck of the onion will become soft, and some morning the whole crop will be flat upon the ground. Very soon after this they are ready to pull.

If the grower has a large acreage he will have a machine for topping. These machines range in size from small ones that three men can run and which will top a few hundred bushels a day, to those which require a dozen men to run and which will top several thousand bushels a day. Small growers still do this work by hand, and in pulling the onions will pull two rows at a time, laying them carefully with the bulbs in one row and the tops drawn out at right angles to it. The next two rows are placed in a parallel line with the tops extending in an opposite direction from those in the first line. Then with sheep shears the tops are cut off and the onions of four rows are left in one.

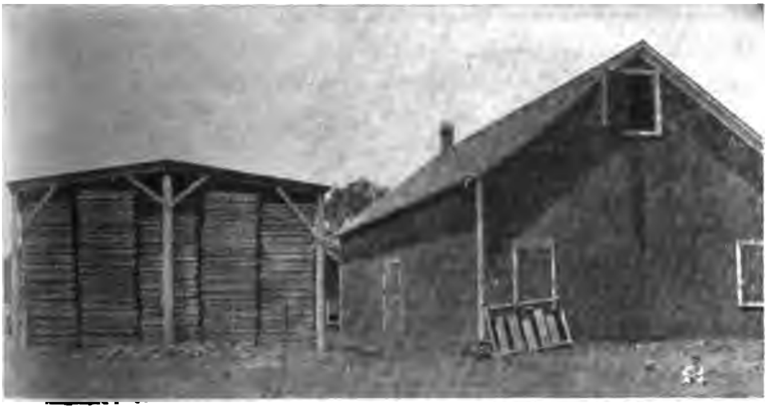


FIG. 425.—ONION CURING SHED AT LEFT, FILLED WITH EMPTY CRATES; ONION STORAGE HOUSE AT RIGHT

Crates are then taken into the field, the onions are picked or shoveled up and the crates are piled in rows usually four high and covered with boards to protect from storm. The next work is screening. Only those onions which are large enough to go over an inch and a quarter screen are first. Those which fall through the screen usually sell for half as much as the larger ones.

After the crop is harvested there comes the great problem disposing of it. Whether to sell from the field or place storage and wait for an advance in price, is the problem. onion reports are of value, but it is a very wise man indeed can tell anything about what the market will be.

Unless the grower has his own storehouse there must b great advance in price in order to make the storing profitable, the cost of storage and the shrinkage in weight will soon wipe all the profits there may appear to be in an increase of price bushel.

COST OF GROWING THE CROP, AND YIELD

The cost of growing an acre of onions is about $135.00. So times a thousand bushels will be grown on an acre, although ei hundred bushels is considered a good crop. The average price bushel received by the grower for the last ten years is about cents, so that one can reasonably expect a net income of two three hundred dollars from each acre.

DIFFICULTIES

An old Irishman who had grown onions for years, when as what effect a flood would have upon a crop, replied, "Inic inions, little divils, you can't kill 'em!" But there are seve things that may reduce the yield to a point where it ceases to profitable. The chief troubles are the maggot, thrip and bli

The maggot appears upon the scene very early. When plants are only three or four inches high one of them may se wilted. Investigate, and two or three maggots may be found the plant. These maggots would develop into flies which wo lay eggs from which maggots would be hatched and so on summer, and every maggot takes its toll from the onion crop. prevent the maggot, some recommend the use of kainite, oth salt; but while these may discourage the maggot somewhat, is doubtful if they are very beneficial.

The thrip comes next and makes its presence known by spotted appearance of the stalk. Nothing has been found as that is effective in fighting this pest.

A little later comes the blight. The tips of the stalks t brown, and gradually the entire stalk becomes brown, the b

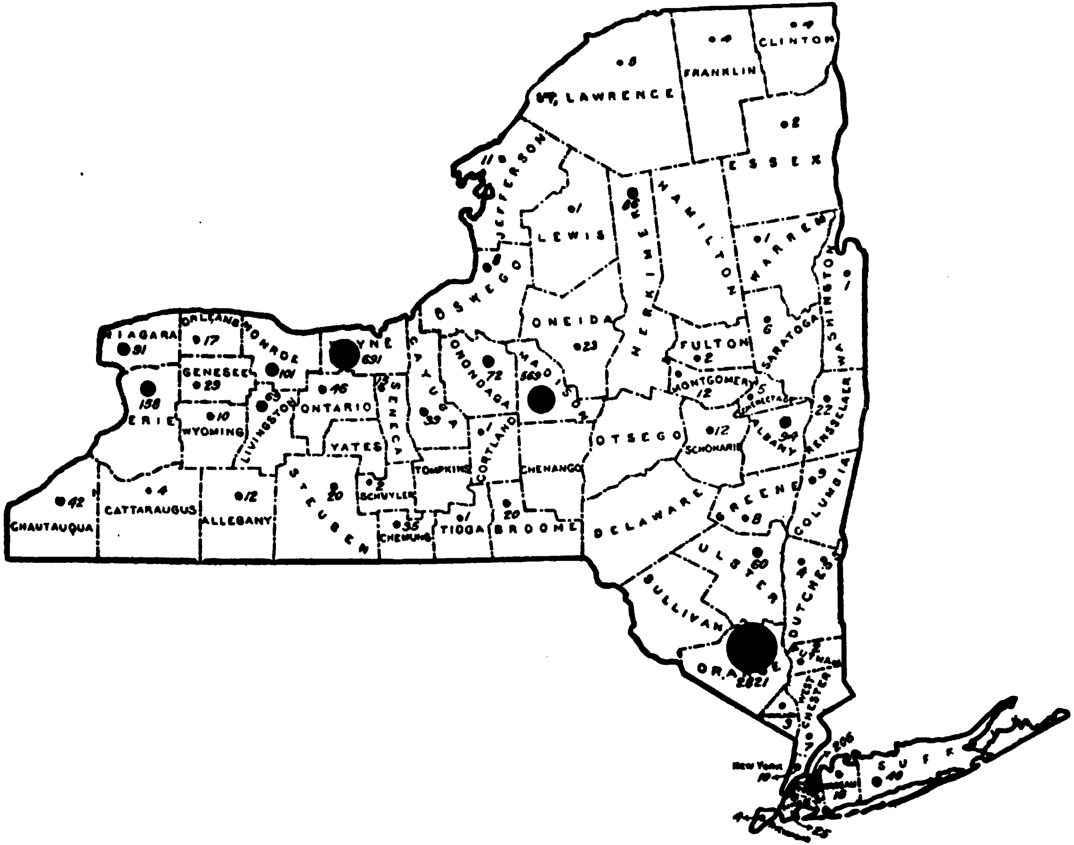


FIG. 426.— MAP SHOWING ONION ACREAGE. FIGURES REPRESENT ACRES IN UNITS

stops its growth, and everything is at a standstill. It is claimed that spraying with bordeaux mixture is a preventive but the difficulties attendant upon doing this are many. It would seem that good drainage, sufficient fertilizer, thorough cultivation, and keeping the plants growing all through the season is the best and only way to fight the enemies of the onion.

TOMATOES

C. C. Hulsart, Matawan, Monmouth County, N. J.

HISTORY

In an article of this kind it is interesting to note the history of the tomato, its gradual rise. in popularity and the rapidity with which new varieties appeared when once its position was assured. Originally an American contribution to horticulture, it was first used as food by the Latin races of Europe.

Philip Miller in his Gardeners' Dictionary, 1731, says, "The Italians and Spaniards eat their apples (love apples) as we do cucumbers — with pepper, oil and salt — and some eat them stewed in sauces, etc., but, considering their great moisture and coldness, the nourishment they afford must be bad. In New Orleans they were used in catsup as early as 1779, but in the English colonies tomatoes were planted only as ornaments, under the name of "love apples."

In 1798 the tomato was introduced near Philadelphia but was not sold as a vegetable until about 1829. In 1836, however, it had begun to be popular as food. Thomas Bridgman, in his Kitchen Gardeners' Instructor, tells us that at this time the tomato was used in sauces as desert, as a substitute for peaches, and that it also made excellent pies and tarts. There were only two varieties, however,— the large red and the cherry.

Their use gradually increased, and in 1841 "they had become almost an indispensable dish through the summer months on every table." In 1847 there were six or seven varieties, with but little difference in them. By 1860 hundreds of acres were planted with this fruit in the vicinity of Philadelphia alone, and some efforts had been made to secure improved sorts, a smooth kind being especially desired. Shortly before 1860 a large, smooth, red variety became popular. At this time there were, besides the yellow and cherry kinds, but four varieties, and only two of these were widely known.

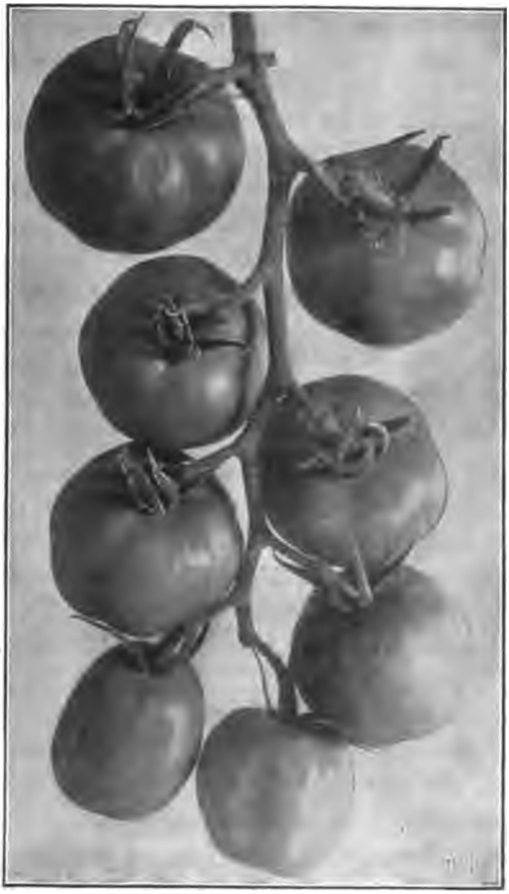


FIG. 427.—NEW STONE TOMATO. THIS IS CALLED THE KING OF THE LIVINGSTON KINDS, WHICH ARE THE BEST TYPES OF LARGE, SMOOTH, SOLID, "BEEFY" TOMATOES

VARIETIES

In 1865 the tomato was a universal favorite. It had become a commercial staple and one thousand acres are said to have been devoted to its cultivation in the neighborhood of Philadelphia. During that year the Tilden appeared and at once took first rank.

This variety was introduced by Henry Tilden of Davenport, Iowa. In the next five years the Maupoy, Foard, Eureka, Cook's Favorite, Boston Market, Dixey, Crimson Cluster, and General Grant were introduced, the General Grant being the best of the number and a really good tomato. In these five years more varieties were brought forward than had been known during the preceding fifty. The canning industry consumed thousands of bushels, and the interest in the tomato was widespread.

For many years lovers of the tomato had been selecting seed in order to improve the existing sorts and the new varieties were the outcome of this work. The best variety introduced up to that time was the Trophy, introduced in 1870 by Colonel George E. Waring of Ogden Farm, Newport, R. I., who was a farmer and a sanitary engineer. The time was ripe for a tomato of a new type, one which would be large and early, and, above all, with a regular apple-like form. The Trophy came at the right time and it was the right thing. Its success was assured — it was unbounded. It was almost the making of modern tomato culture. The Trophy was the result of twenty-three years of careful selection and in spite of the high price ($5 for 20 seeds) it was soon widely distributed and became a universal favorite. From six varieties in 1860 the number increased to thirty in 1880 and by the opening of the twentieth century American seedsmen were cataloguing about 250 varieties. Of these, possibly 50 may be distinct and better than the Trophy.

The evolution of the tomato in less than a century has been exceeded by no other fruit or vegetable. Today we have upwards of three hundred strains and varieties so varied that some of them must suit the most skeptical. We have in colors various shades of red; then we have the pinks and deeper purple varieties. These are very popular in certain markets but tender in flesh and poor carriers if allowed to ripen before shipping. Furthermore, we have several shapes and shades of the yellow varieties. These last are only valuable for preserving, and can not be disposed of in large quantities. Eliminating the yellow sorts, the red and purple varieties may well be divided into three classes — the early sorts, the medium and the late. In some tomato growing sections the early and medium early varieties are all that are considered because these varieties are more valuable when marketed than any of the late sorts. This is generally the case when the location is within easy shipping distance of some large city. On the other hand, where the cost of shipping is too great, the late varieties are grown for canning purposes or for making catsup.

GROWING EARLY TOMATOES

The early crop although the most expensive to grow is at the same time the most profitable where it can be grown successfully and marketed economically, but it requires far more skill to produce it. First, the seeds must be planted in a manure hotbed or greenhouse about two and one-third months prior to the time the plants can be planted out in the field. They are grown in the seed bed until about five weeks old and then transplanted to cold frames. The beds must be made by using about three inches of manure (new horse manure preferred) on which is placed five

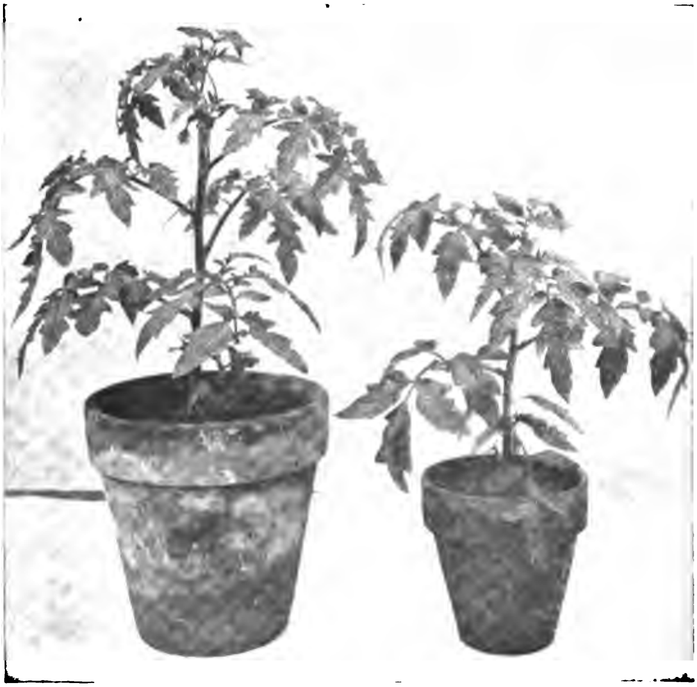


FIG. 428.— WELL-GROWN TOMATO PLANTS READY FOR TRANSPLANTING

inches of good soil and raked level. This soil should be made up of about one fourth rotted animal manure and three fourths loamy soil, and should be worked over together before placing on the beds.

When the beds are completed and raked level, mark off four and one-half inches each way for the first early sorts; set the little seedling plants in each cross or check, being careful not to set the plant below the seed leaves. Deep planting is dangerous at this season of the year. As fast as plants are set put on sashes, and, if much wilting occurs, shade the glass for a day or two during the warm part of the day. As soon as the plants begin growing give plenty of air by raising the sashes, and when the weather becomes warm remove them altogether. This gives a strong and hardy plant that will stand conditions when set in the field.

The cold frame beds will soon dry out and require watering. At first, while plants are young, light waterings will answer, but as the plants become larger more copious wettings will be required. One good wetting that penetrates deep into the soil is worth two or three light ones that moisten the soil only half an inch.

Plants in cold frames should be in full bud and an occasional bloom in five weeks after setting. The last week, or at least four or five days prior to removing to the field, sashes should be removed entirely both day and night to allow the plants to harden. For the same purpose they should not be watered during this period.

The early tomato crop can not be grown to advantage on heavy soil as it warms up too slowly in spring; hence a sandy or sandy loam soil is essential for best results, and the soil need not be very rich.

MANURE AND FERTILIZERS

If the soil is too rich a heavy vine growth will be the result at the expense of fruit. Rather start with a comparatively poor soil and then feed with animal manures spread broadcast before plowing at the rate of eight to ten tons per acre, after which use three hundred pounds of some high-grade fertilizer in the hill under the plants, incorporating it well with the soil before setting out the plants. A fertilizer made up from high-grade materials and analyzing 7-7-5 gives very good results when used at the rate of three to three hundred and fifty pounds per acre. This on some light soil is supplemented by a dressing on two sides of the plant early in its growth of about one hundred and fifty pounds of nitrate of soda. An excessive use of nitrate of soda is to be avoided because when used in large quantities it produces too much vine growth at the expense of fruit. And what nitrate of soda is used should be used as early after plants are set as possible, because at that time there are less nitrates available from natural sources than would be the case later when nitrification is more active.

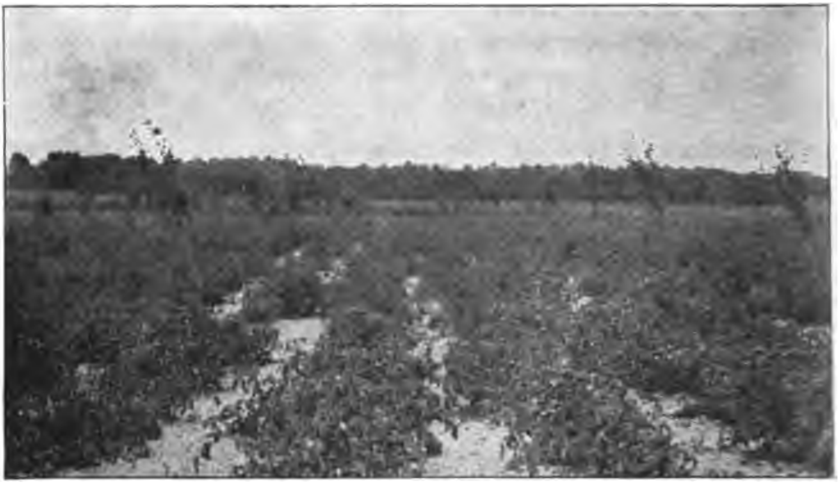


FIG. 429.—TOMATOES GROWING AT WILL, THE GENERAL PRACTICE WHERE GROWN FOR CANNING

Cultivation must be done early and often and should be continued as long as the vines will permit working between them. Many growers produce what is known as a second early crop. For this purpose a little later variety is chosen, not because it is a little later in ripening but because by its being a little later in ripening it is a better tomato, smoother and larger, hence sells at a higher price. Among the many varieties chosen for this crop are Bonny Best, Dwarf Champion, Twentieth Century, Dwarf Stone, John Baar (new), and many others.

THE CANNING CROP

Last but not least comes the canning crop. In many sections this is an important crop, thousands of acres being grown annually. The crop is handled from seed to maturity so radically different from the early crop that special mention should be made of it in an article of this kind lest some one go astray by trying to grow the late varieties by early methods as herein set forth.

Late varieties, with the exception of the dwarfs, are by nature heavy vine makers; hence it is easy to induce them to overdo that propensity, and when we do this we do it at the expense of fruit. Then too, this crop grows at a season of the year when the soil is warmer than it is when the early crop should be hustling; hence no stimulation by applications of nitrate of soda should be used as a supplement. Neither do we want as much animal manures, seven to eight tons being plenty on soils in a good state of fertility. The fertilizer formula should also be changed. A 4–8–10 is what is commonly used by progressive growers and the quantity reduced from 25 to 30 per cent.; but on poor soils a side dressing of the same fertilizer in place of the nitrate of soda is frequently given with good results.

The plants for this crop are seldom transplanted but set in the field direct from the seed bed; hence the plants are much more cheaply grown. They should be grown in a bed under glass and not out in the open as is commonly done, because when grown in the open, unprotected, they are slow in growth, not permitting the planting in the field soon enough to harvest the whole crop before cool nights and possible early frosts claim a portion. The late crops for the can house should be in the field by the end of the first week in June and the further north we go the earlier they should be planted. The custom here is to mark off our tomato fields in checks four feet each way for the early sorts and four and one-half for the medium and late sorts, and cultivate in both directions. The principal varieties for early are Earliana and King of Earlies; a few are still growing Maule's Earliest. While the pink or purple varieties are good, not as many of them are grown as formerly.

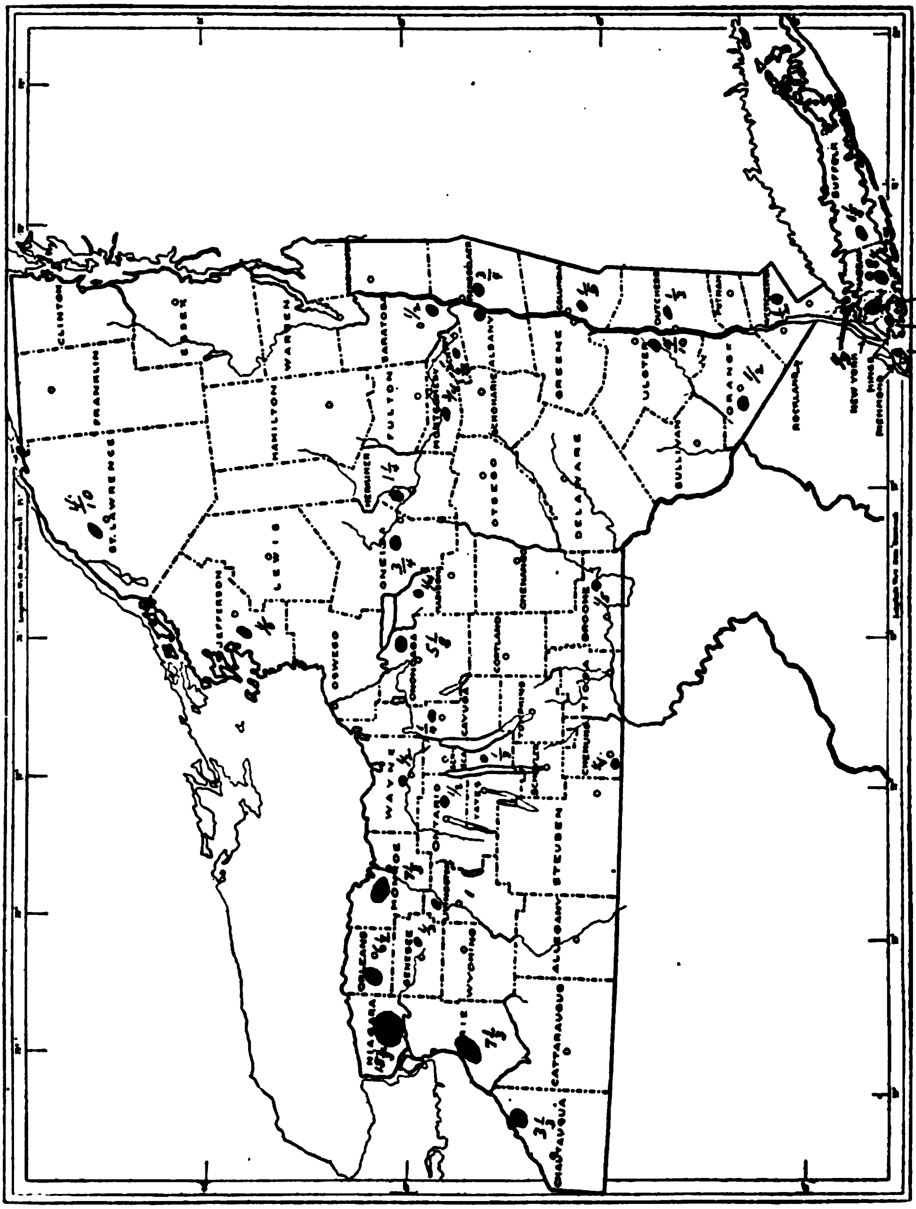


FIG. 430.— MAP SHOWING TOMATO ACREAGE. FIGURES IN COUNTIES

For late tomatoes either for market or cannery, there are a number of varieties or strains. Among the best are the old paragon, Matchless, Stone and Success. The last named in my judgment is the best for can house purposes. The Stone is best for market because it is harder and stands up better but is a shy cropper. The Success is a heavy bearer, is of a deep red color, but is a little later in maturing than either of the others. An acre of tomatoes for cannery can be produced for from forty to forty-five dollars per acre, and ten tons should be the yield. The writer has produced fourteen tons and slightly over, but this is the exception rather than the rule.

ACREAGE AND VALUE OF TOMATOES GROWN IN NEW YORK STATE BY COUNTI

(Taken from U. S. Census, 1910)

County	*Acres*	*Value*	*County*	*Acres*	*Val*
Albany	400	$42,961	Oneida	63	$12,5
Allegany	2	100	Onondaga	514	38,3
Bronx	.....	....	Ontario	41	2,8
Broome	18	3,346	Orange	48	6,0
Cattaraugus	12	1,006	Orleans	659	37,1
Cayuga	22	3,610	Oswego	8	2,1
Chautauqua	335	28,153	Otsego	.....	......
Chemung	23	2,839	Putnam	.....	......
Chenango	.....	....	Queens	1,054	111,2
Clinton	6	2,100	Rensselaer	71	7,5
Columbia	20	2,352	Richmond	487	35,9
Cortland	.....	....	Rockland	12	1,8
Delaware	.....	....	St. Lawrence	39	3,2
Dutchess	26	3,398	Saratoga	44	8,4
Erie	738	68,863	Schenectady	59	9,2
Essex	6	300	Schoharie	4	8
Franklin	8	775	Schuyler	1	1
Fulton	7	391	Seneca	28	3,5
Genesee	32	1,626	Steuben	3	7
Greene	13	1,263	Suffolk	117	10,8
Hamilton	.....	....	Sullivan	1	
Herkimer	124	3,237	Tioga	.....	......
Jefferson	17	2,550	Tompkins	9	1,6
Kings	35	2,464	Ulster	38	4,2
Lewis	1	32	Warren	3	1,0
Livingston	101	4,609	Washington	3	1
Madison	24	1,947	Wayne	40	2,7
Monroe	730	73,915	Westchester	48	8,8
Montgomery	76	9,329	Wyoming	1	3
Nassau	854	100,625	Yates	10	6
New York	34	3,443			
Niagara	1,567	98,088	The State	8,636	$775,8

* TRIUMPH OF THE ITALIAN TOMATO

The tomato was given to the world by America, but Italy is today teaching the rest of the world by example how it should be raised and how it should be preserved. Italian canned tomatoes have practically pushed the American product out of the English market, and have gained an enormous market in the United States. The Italians raise a solid meaty tomato of fine color and it is so packed in the cans that the consumer is not obliged to pay for a large percentage of water.

Canned tomatoes, however, are put up principally for the export trade. The Italians themselves prefer their tomatoes in the form of sauce, or paste, which is nothing more nor less than boiled down tomato pulp, minus the skins and seeds, as set forth in an interesting manner in a report by Commercial Agent J. Alexis Shriver entitled "Canned-Tomato Industry in Italy," recently issued by the Bureau of Foreign and Domestic Commerce. This sauce is put up in cans and is used by the Italians in a great variety of dishes, of which spaghetti is perhaps the most familiar to Americans.

According to fairly accurate statistics the area planted in tomatoes in Italy is about 22,000 acres, producing about 385,000 tons. The exports to the United States amount to about 20,000,000 pounds of canned tomato and tomato sauce; and some 8,000,000 pounds of the product go to South America. The total value of the tomato exports from Italy is well over $6,000,000.

The skins and seeds that were formerly wasted are now utilized, the former as stock feed and the latter as a source of oil. The crude oil is suitable for soap making and for lamps, and the refined oil is said to be edible. Commercial Agent Shriver's report, Special Agents Series No. 93, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, at 5 cents a copy.

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*Taken from Circular issued by U. S. Department of Agriculture, Washington D. C. dated Feb. 9, 1915.

CABBAGE

E. N. Reed, Cortland, N. Y.

As time advances it becomes more and more apparent that each of our vegetable crops must have some special thought if we are to continue their culture.

If one were to pass through some of the older cabbage districts it would be a noticeable fact that a great many fields showed disease while others looked stunted. Many of these conditions might have been avoided had attention been paid to keeping disease off the farm and practicing more intensive cultural methods. With less acreage, still producing the same number of tons, the period between two cabbage crops could be lengthened. The cabbage is one of the crops that requires a very long period before another crop of the same kind is put on the field. If this lengthy period does not occur the soil will become infested with disease and insects, and available plant food necessary for this crop will be lacking.

Because I am a producer of cabbages by the hundred tons does not imply that the work is done in a wholesale way, but rather that attention has been paid to the small details and conditions which go to make yields of twenty to twenty-five tons per acre. Only once in the past six years has my yield fallen below the twenty-ton mark.

With the thought of still keeping at the cabbage business I shall try to offer a few suggestions that will tend toward a longer and more successful period of cabbage culture both from the large and small grower's standpoint. It is always the attention to small things that brings success in larger ones.

DIFFERENT TYPES

The cabbages that are grown in this state can be divided into three classes according to their time of maturity. First comes those belonging in a class with the Early Wakefield. Most of these are raised by gardeners for early market trade. The plants are started in a greenhouse and carried to the field where they are transplanted. Cabbages in this class are rather small, most of them being conical in shape. Of all the early varieties perhaps the Early Jersey Wakefield is the most popular.

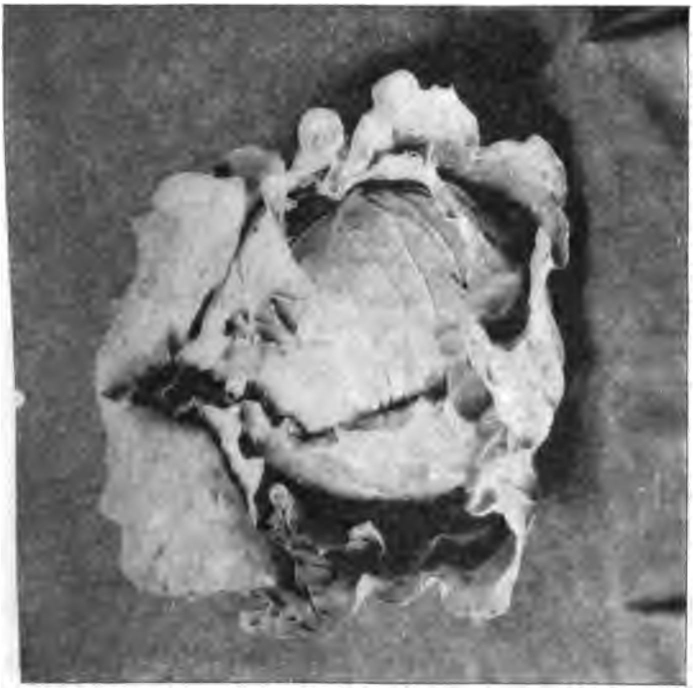

FIG. 431.—ALLHEAD EARLY

The second class covers those called Domestic. The varieties in this class mature in the early fall. They are desirable for both market and kraut purposes. There are three varieties in this class that seem to have considerable merit — the old standard Warren, the Succession and the Autumn King. The Succession has the most uniform type of head of any cabbage I am familiar with. Any one of these true varieties is a heavy cropper.

Third comes the late commercial class. Most all of this class are called "Danish." The Geneva Station collected twenty-two varieties in this class and tested them out; hardly any two looked alike. The writer has had so much trouble in the past with poor seed from these varieties that he has arranged adequate facilities and is now producing his own. After six years of hard work along this line a strain has been selected that can be depended upon to produce a crop.

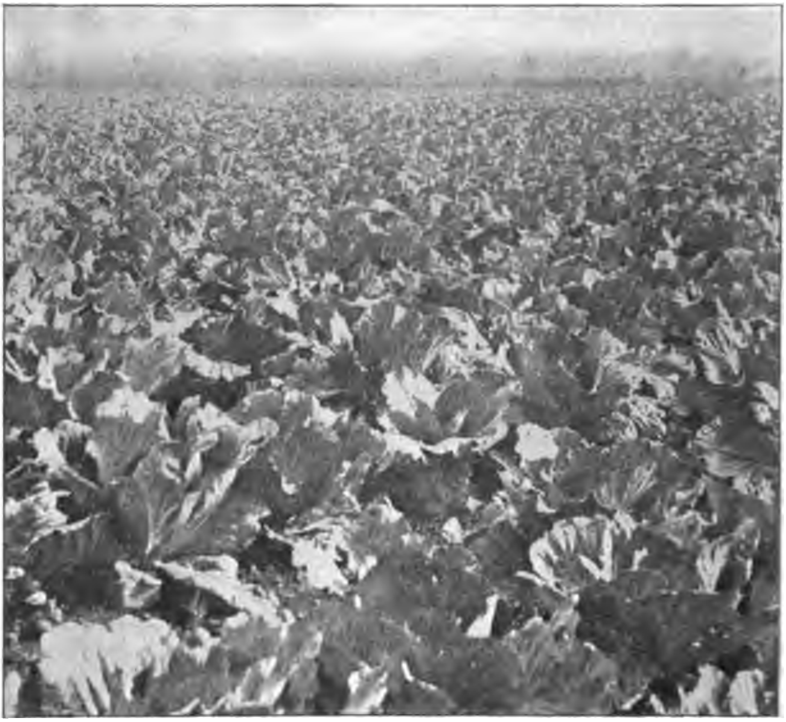

FIG. 432.—A CROP OF DANISH CABBAGE

The late varieties are grown to such an extent that they are one of the large cash crops of the state. Most of the heads are more or less round, very solid and have good keeping qualities. There is also a red strain in this class which is not so heavy a yielder, Red Rock being a standard variety here.

SEED

As with other crops, good seed is one of the important factors. Formerly most of our seed was imported, but now a great deal is raised in this country. Michigan, Long Island and Oregon all lend a hand, each having sections favorable to seed production. So small a quantity is required for an acre that there seems to be a great deal of mixing of varieties. If one does not know positively about the source of his supply it is a very safe way to purchase a year's supply ahead; then it can be tested out.*

The seed can be sown either by hand or with a seed drill. Never sow seed and fertilizer together. The seeds do not need to be covered over one-half inch but the ground should be around them. Never sow seed just before a rain; wait until after the rain when the ground has become dry enough to work again. Cabbage seed objects to coming through a crust formed by a hard shower.

One pound of seed is none too much for two acres, taking into account the uncertainties of the weather and the insect trouble, if the bed is not to be screened. Invest your dollar in seed rather than in some one else's diseased plants. A few extra plants to sell help to pay the cost of seed.

CABBAGE SOIL

The cabbage, being one of our hardiest vegetables, will adapt itself to most soils. Those of a gravelly nature are not so suitable because they will not hold moisture. The crop often does best on the clay loam found on so many hills and uplands of the state. Perhaps why this type of soil was not used for cabbage growing in the past was because it was not properly tilled and well fertilized.

PRODUCING PLANTS

There seems to be as many failures in getting a stand of cabbage plants as in all other failures combined. Care should be exercised in selecting a spot on which to sow seed. The ground should be mellow, well-drained and free from weeds or cabbage disease. Avoid spots where there has been an old manure pile or soakage from a barnyard. In such places club root is apt to develop. It is becoming quite common in some sections to break up a spot in a permanent pasture for the seed bed. Of course this should be done in the fall in order that the ground can be well fitted. It is a good plan to use a liberal dressing of lime or wood ashes on the bed, making it white all over.

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* See article on "Good Seed" by Prof. Myers, page 1305.

Commercial fertilizers are best suited to growing plants because of their freedom from weeds. For one pound of seed I should use nine hundred square feet of ground, and to this apply one hundred pounds of 4-10-8 fertilizer. It is preferable to have all the nitrogen in this fertilizer derived from nitrate of soda. It should be thoroughly worked in before the seeds are sown. In some sections the plants are raised in rows; the fertilizer is sown in rows and worked in.

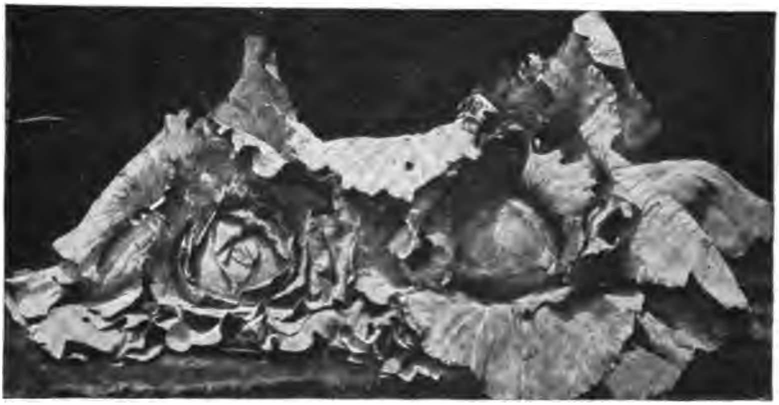


FIG. 433.—GOOD AND POOR TYPES OF CABBAGE OF THE SAME VARIETY

PREPARATION OF THE FIELD

Sod ground is perhaps best suited to grow this crop. Often a very bad mistake is made by not plowing the ground early enough to preserve all moisture. Fall plowing is best. In the spring the field should be dragged at least once a week until setting time. This will preserve all the moisture and also kill most of the weeds. Very few other crops require so much moisture, or more thorough preparation of the soil.

FERTILIZATION

Cabbage needs plenty to eat as well as to drink, if we expect to get good yields. This does not mean that it needs wet land. I like to think of a cabbage plant as a filter. The soil water is taken in through the roots and the sun evaporates the moisture thrown off by the leaves. What is left in the plant is used for growth.

It takes as much fertility out of the soil to raise five tons of cabbage per acre as it does to produce twenty bushels of wheat.

Manure and commercial fertilizer make the best combination. Ten tons of manure per acre, six to eight hundredweight of 10 per cent. phosphoric acid and 8 per cent. potash usually will supply enough plant food. If no manure is at hand ten or twelve hundredweight of 4–8–10 will answer. This fertilizer is only suggestive. No rule can be given for all the varied conditions.

It takes about one thousand parts of water to make one part of commercial fertilizer all available for a plant.

If the soil needs lime it is a good plan to apply a dressing to the field, since the crop needs a liberal supply. Lime or fertilizer should always be applied broadcast. Spreading the fertilizer has a strong tendency to spread the root system. This is essential since the plant is a gross feeder.

SPACING AND SETTING PLANTS

No one can give a definite rule for the proper spacing of cabbage. The distance apart will depend upon whether early or late varieties are grown, the fertility of the soil, the size of head desired and the moisture supply. It is probably best to raise all early cabbage in drills, the plants set from twelve to eighteen inches apart in rows thirty to thirty-six inches apart. Domestic and Danish need more room. They should be placed from eighteen to thirty inches in the row, the rows being thirty-six inches apart.

Check rowing. is practical in some places and meets with excellent results, especially if the ground is weedy. This method reduces hand labor to a minimum, the only objection being that the wide spacing which is generally practical produces very large heads. Heads weighing from eight to twelve pounds are large enough for city trade. The large heads may be avoided if one will set closer and use a narrow cultivator when going the narrow way. The writer very much prefers the check row method.

Cabbage setting is more important than most of us think. Too often there is a fight for a week or ten days before the plants really start to grow. This is caused by spoiling their root system or setting in too wet ground. It is best to loosen the plants in the seed bed when taking them up. The more of the root system one can maintain the quicker the plant will start. Medium sized plants are preferable to large ones because more of their root system can be maintained. It is not good policy to set plants when the ground is wet as one can not then help packing the ground around a young plant. The sun will dry out this packed earth leaving the plant in the hard, dry soil. There should be a dry mulch of soil maintained around a newly set plant.

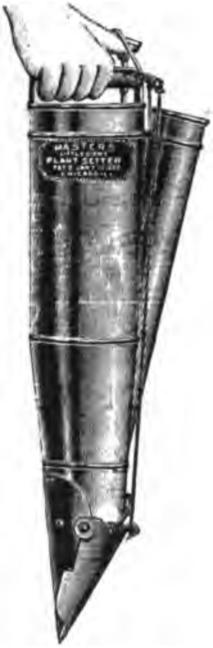


FIG. 434.—MASTER'S PLANT SETTER

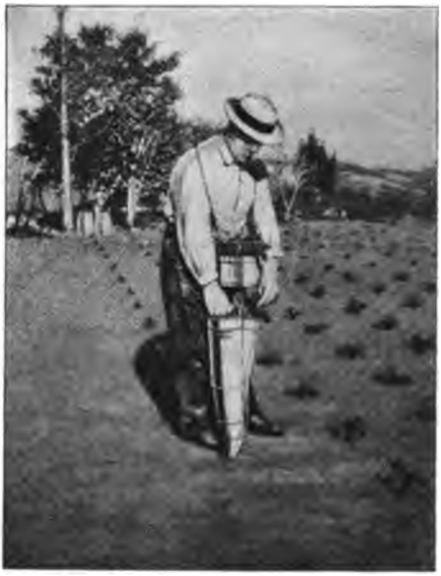


FIG. 435.—PLANT SETTER IN ACTION

Of all setting tools I prefer the "Masters Plant Setter." This little machine places the plant roots down through the dry soil on the surface into that which is moist underneath. It also seals the plant roots to the ground with water, but does not destroy the surface mulch or pack the ground.

These machines are very inexpensive, costing about four dollars. A man can set one acre per day watering each plant, and there is no stooping, dusty work about it. They are adapted to both large and small areas, as three men, each having a machine, can set more plants than a team outfit, and no skips. Every plant will live, making a perfect stand.

CULTIVATION

The cabbage crop is grown through the dry part of the season, therefore frequent cultivation is very essential. Each time the crop is cultivated the evaporation is checked and moisture collects just below the moisture mulch. The moisture is quickly taken up by the root system and then the plant receives an added amount of plant food.

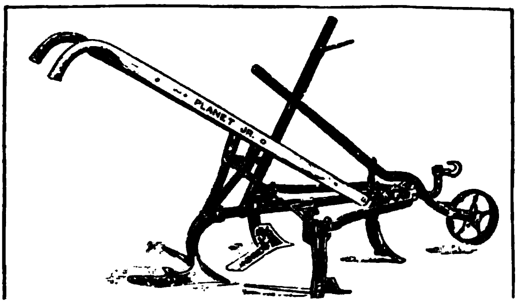


FIG. 436.—PLANET JR. CULTIVATOR ARRANGED AS A MARKET GARDENER'S HORSE HOE, WITH A PAIR OF 10-INCH HOE STEELS AND THE WIDE-FINGERED SWEEP

Shallow cultivation is most essential. Note the difference in the feeding area between two fields, A and B, both being plowed ten inches deep. A is cultivated one inch deep; B three inches.

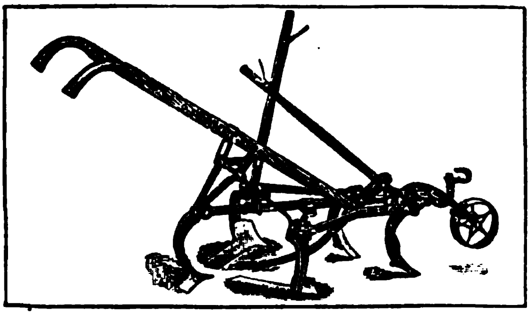


FIG. 437.—CULTIVATOR WITH HOES AND SWEEP IN POSITION FOR SHALLOW WORK. HOES SHOULD BE TURNED OUT FOR LARGE CABBAGE

Field A has nine inches in depth to grow its crop, B has only seven inches. The only time that deep cultivation is justifiable is when the cabbages are growing so fast that they crack. I think the cases will be not over one to the hundred. Generally the smaller heads will more than make up in growth for the lo caused by cracking.

Fig. 434 shows a Planet, Jr., cultivator rigged for cabbage wh the plants are small. When the leaves commence to get large t side blades, or ten inch hoes as they are called, can be revers so that the long end will run out under the leaves without brea ing any off. This allows nearly all evaporation to be check even when the cabbages are large. Cultivation should be co tinued throughout the entire season.

CABBAGE DISEASES

The bacterial disease known as stump rot or black heart is t most serious thing a grower can have in his soil. A crop rotati of even ten years does not se to be a remedy. The cure — keep it out. Other fields a very easily inoculated by carr ing dirt on farm machine animals' feet, or feeding sto diseased roughage, then sprea ing the manure on a non-infest field. Cabbage seeds often car the disease. They should alwa be soaked for fifteen minutes ju before sowing, in the following solution: for one pound of se dissolve in an earthern dish one corrosive sublimate tablet in o pint of water. (These tablets may be obtained from any dr store for one cent each.) After soaking, spread the seed to dr but not in the sun or near artificial heat.

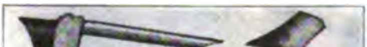


FIG. 438.— SHOWING ARRANGEMENT OF HOES AND SWEEP FOR SHALLOW CULTIVATION

Club root is familiar to us all. A rotation of five or six yea is sufficient to kill it if the ground is kept free from all pla belonging to the cabbage family; this includes mustard. being a slime mold disease, lime greatly helps to keep it in che Often cabbage raised twice in succession on the same ground w show the disease.

INSECT PESTS

The cabbage has three quite serious insect enemies. First, t flea beetle, a small black bug which eats the leaves of the se lings as soon as they appear above ground. Plaster, lime dust or tobacco dust are of some value in keeping them off, but the most practical method is to screen the bed.

This screening will also control the second of the pests, the cabbage maggot. This enemy is a small, white grub which eats the roots of the seedlings about the time the cabbages are ready to transplant. The adult is a small fly that lays eggs at the surface of the ground just beside the stem of the plant. These eggs soon hatch and the young maggot works downward and feeds upon the root system. In many sections it is impossible to get a stand of plants every year unless the bed is screened. The screening consists of setting up boards eight or ten inches high around the seed bed. Over these boards wires are stretched to prevent the screen from sagging. The screen is made of cheese cloth and is stretched over the bed and tacked to the boards. A bed to be screened should be made not over nine feet wide.

One half pound of seed will produce nearly as many plants under a screen as a whole pound in the open, but one should make the seed bed as large as for a whole pound. Under a screen nearly every seed will germinate owing to the humid condition. Put it on as soon as the seeds are sown and remove about one week before seedlings are ready to transplant. The plants will be ready to set seven to ten days earlier if raised in this way.

Sometimes the maggots bother earlier varieties after they are set in the field. A tarred paper pad about two inches square should be placed around each plant. They are made by punching a hole in the center, then cutting a slit from the hole to the edge. This prevents the fly from laying eggs near the stem of the plants.

Third, is the plant louse. This louse has great power of reproduction, being capable of rearing from twelve to twenty litters of brood in a single season. In turn the young will multiply when only six days old. They are sucking insects and are therefore controlled by the use of contract spray. Three-fourths of a pint of Black Leaf 40, four pounds of whale-oil soap and sixty gallons of water are used as a spray solution. Great care must be taken to wet the lice thoroughly; they will be found in the curls.

For large areas a power sprayer with two leads of hose, ea being carried by a man, make the most satisfactory outfit.

In rare cases the green cabbage worm makes considera trouble. This is a chewing pest and should be killed with pois The poison solution should contain some bordeaux sticker to ma it cling to the leaves.

MARKET CONDITIONS

Most of the early cabbages grown are for local trade, very f being shipped, as are the Danish. The market for these a the Domestics is firmer than for the Danish. A large share the Danish raised have been stored for winter and early spri trade, but in the last few years there has been large quantities southern cabbage sent to supply the same market. As a res stored cabbage has brought less money.

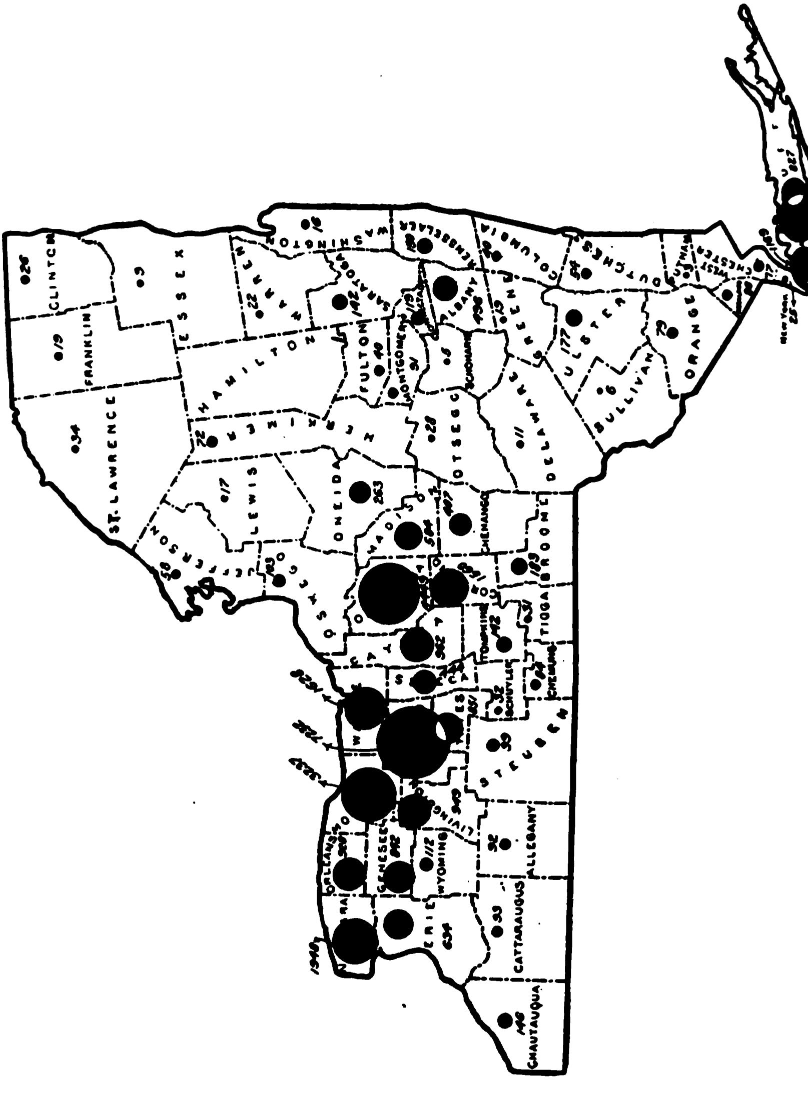
The choice of either selling from the field or holding cabb will usually be governed by certain conditions. For the past f years holding late cabbage either in a cabbage house or laid do has brought very small returns for the labor, unless a man has some special winter market.

If a grower expects to make a business of holding his crop i necessary to protect the cabbage from freezing. Some make practice of laying the cabbage on the ground in some shelte place, either in the woods or some place in the open where snow will drift over them. They are placed stump down and c ered with straw, swamp hay, or, best of all, leaves, to a depth perhaps six inches. Some prefer to erect a double-walled bui ing with narrow bins on each side and a driveway through center. Either method is very satisfactory.

A man will make about as much money to sell his crop ev year as to hold it, and it seldom pays to switch from one pract to the other. If the price of cabbage falls much below five doll per ton from the field there will be very little money made selling.

The dairy farmer here has a chance to get at least pay for fertilizer and labor. The general opinion of the dairy farme that the cabbages are worth from four to five dollars per ton feed. I prefer to place them at four. Under average conditi it will cost not far from four dollars per ton to raise and market a crop.

The average yield of the state is about ten tons per acre. If a grower will raise his yield to twenty tons the cost per ton can be reduced to about three dollars for production and marketing.


CLINTON
ESSEX
FRANKLIN
ST. LAWRENCE
HAMILTON
WARREN
WASHINGTON
SARATOGA
FULTON
MONTGOMERY
SCHOHARIE
ALBANY
RENSSELAER
COLUMBIA
GREENE
DUTCHESS
PUTNAM
WESTCHESTER
ULSTER
ORANGE
SULLIVAN
DELAWARE
OTSEGO
HERKIMER
LEWIS
JEFFERSON
OSWEGO
ONEIDA
MADISON
CHENANGO
BROOME
CORTLAND
TOMPKINS
TIOGA
CHEMUNG
SCHUYLER
SENECA
STEUBEN
LIVINGSTON
WYOMING
GENESEE
ORLEANS
ERIE
ALLEGANY
CATTARAUGUS
CHAUTAUQUA
NEW YORK

ACREAGE AND VALUE OF CABBAGE GROWN IN NEW YORK STATE, BY COUNTIES

(Taken from U. S. Census, 1910)

County	*Acres*	*Value*
Albany	496	$38,744
Allegany	92	6,926
Bronx	......	....
Broome	183	14,298
Cattaraugus ..	93	8,024
Cayuga	962	67,259
Chautauqua ..	146	12,756
Chemung......	84	6,299
Chenango	407	37,483
Clinton	26	3,764
Columbia	40	3,932
Cortland	1,560	144,452
Delaware	11	1,910
Dutchess	54	5,497
Erie	634	63,917
Essex	9	1,632
Franklin	19	2,032
Fulton	40	4,242
Genesee	842	46,310
Greene	19	2,500
Hamilton	......	....
Herkimer	72	8,697
Jefferson	58	5,460
Kings	169	23,189
Lewis	17	2,360
Livingston ...	949	33,501
Madison	584	43,474
Monroe	3,237	180,978
Montgomery ..	91	10,980
Nassau	3,012	241,252
New York.....	25	1,866
Niagara	1,948	69,547
Oneida	263	31,625
Onondaga	4,449	$408,924
Ontario	7,232	265,048
Orange	79	8,227
Orleans	928	62,014
Oswego	103	8,989
Otsego	28	3,751
Putnam	3	150
Queens	1,169	154,502
Rensselaer ...	150	17,038
Richmond	136	14,185
Rockland	86	8,869
St. Lawrence..	34	5,763
Saratoga	142	12,363
Schenectady ...	119	12,461
Schoharie	5	885
Schuyler	32	1,360
Seneca	444	13,004
Steuben	99	7,510
Suffolk	827	58,414
Sullivan	6	465
Tioga	31	3,460
Tompkins	142	12,952
Ulster	177	15,732
Warren	22	3,115
Washington ...	16	2,704
Wayne	1,628	71,658
Westchester ..	77	7,744
Wyoming	112	6,645
Yates	851	23,131
The State.	35,269	$2,335,999

CUCUMBERS

C. R. WHITE, IONIA, ONTARIO COUNTY, N. Y.

Farmers' Institute Lecturer

EXTENT OF THE INDUSTRY

The cucumber crop is of greater importance than is general believed. Cucumbers are grown over a very large range of ter tory, thriving over the entire country. They are grown perha more largely for pickling than for any other purpose, but ma hundreds of thousands of bushels are grown in the United Stat for table use; these are of a size ranging from 1¼ to 2½ inches diameter, and are used for slicing. The over-sized ones are al in demand for frying in seasons when egg plant is scarce.

FIG. 440.—FIELD OF CUCUMBERS ON FARM OF WHITE FARM CO.; YIELD, 19
600 BUSHELS PER ACRE

In New York State there are a number of large produci sections where both pickles and slicers are grown. On Lo Island the industry is carried on very extensively, Shelt Island "cukes" being well known on the New York market. I the regions of Orchard Park and Ionia, in the western part the state, many thousands of bushels are grown for the slicing trade, each season.

There are numerous pickling and brining companies that annually contract for pickles, but their prices as a rule are not very remunerative, and they shift from place to place, finding new territory every few years.

Near Rochester, in the Irondequoit garden district, there are many large hothouses devoted to growing cucumbers, which is a very profitable business.

SOIL AND FERTILIZERS

The cucumber may be grown on almost any loose, well-drained soil, but it prefers the sandy or gravelly soils. It will not do well on soils that are heavy, or even on sandy soils of a silty nature, which become compact after rains. The soil should be well filled with humus and free from acidity. The black mucky loam gives good results but is usually situated on too low ground and is too subject to frosts to be very certain.

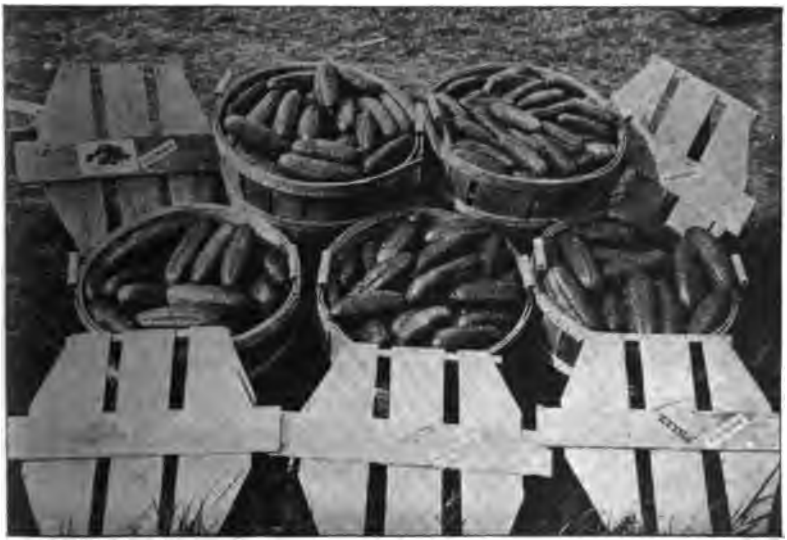


FIG. 441.— FIVE GRADES INTO WHICH THE IONIA GROWERS' ASSOCIATION SORT THEIR CUCUMBERS

A medium application of manure is desirable when possible. For a fertilizer we would recommend one containing a goodly amount of nitrogen derived from both nitrate and organic matte rather high in phosphoric acid, derived from a non-acid sourc such as steamed bone, and containing a small amount of potas

Among the best crops we have ever had were those grown wher green manure was plowed under and fertilized.

PLANTING AND THINNING

A number of methods of planting are practiced: six by si feet in hills, thinned to four plants; three by six thinned to tw plants, and in drills six feet apart, a plant every sixteen to eighteen inches. It is largely a matter of choice which is use However, one of the latter distance is preferred, as it gives a better distribution.

Plenty of seed should be used, as the striped bug will sometimes thin the plants considerably when small. They should not b planted until the ground is fully warm, so they will come u quickly and grow without set-backs.

The thinning should be done before the plants begin to b crowded. I prefer two thinnings: the first as soon as the secon leaves are fully developed, leaving twice the number required the second, at the last hoeing, just as they are about to fall dow and run.

They should have frequent but shallow cultivation. They ar injured badly by root pruning, and great care should be take not to cultivate either too deep or too close to the plants.

TWO ENEMIES

Two cucumber enemies are the striped beetle and squash bu which, when numerous, are kept off by lime or other repellants but they are rarely bothersome enough when a large acreage i grown to require any treatment. A more serious trouble is th bacterial blight, the only cure for which is to pull and destroy th wilted plants. Leaf blight and mildew may both be controlled b spraying with standard strength bordeaux mixture.

VARIETIES

The varieties grown for pickles are usually some one of th special cluster and picking varieties, each section having its preference.

For slicing, the white spine varieties, of which there are numerous strains, are most in use. The market prefers a variety which is green and holds its own in color well after being picked.

The hothouse growers in New York State prefer the longer varieties of the Chinese class, while those near Boston grow the Arlington white spine, which is also a favorite outdoor variety.

FIG. 442.—LOADING CUCUMBERS AT IONIA PACKING HOUSE

PICKING AND PACKAGES

In a good growing time cucumbers should be picked every two days, and should not be over two inches in diameter for best market.

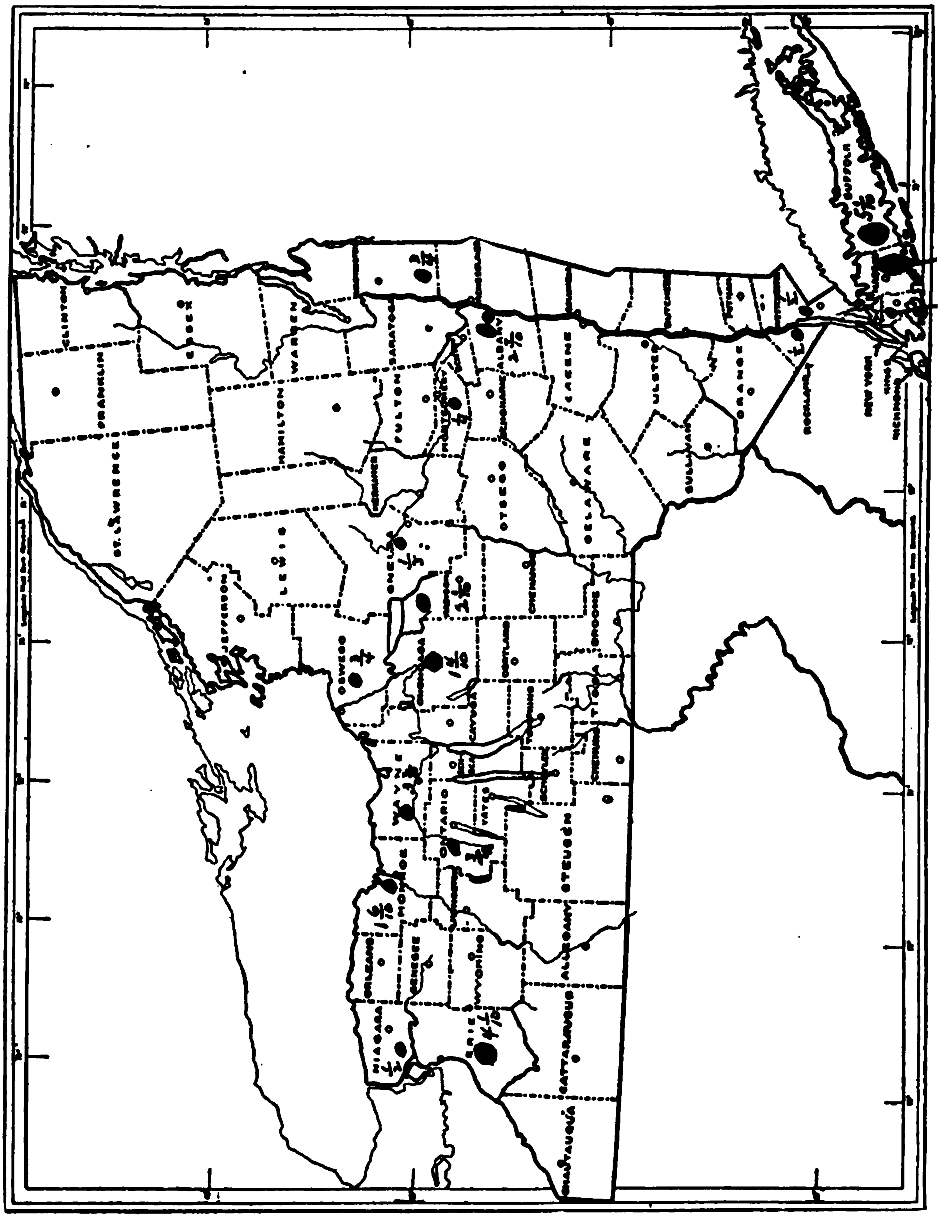
The favorite package in New York State is the standard bushel basket with slat cover, and the "cukes," as they are known on the market, should be graded as to quality.

PROFITS

As for the profits, it is like many other of the vegetable crops — there is a wide fluctuation in it from year to year, the climatic conditions having a marked influence on the yield.

The market demand is also governed by the consumption of fresh cucumbers which depends largely on the temperature, many more being used in warm weather than in cool weather.

The Jewish people are the chief consumers of fresh cucumbers.


CLINTON
ESSEX
FRANKLIN
ST. LAWRENCE
HAMILTON
WARREN
FULTON
SARATOGA
LEWIS
JEFFERSON
OSWEGO
ONEIDA
MADISON
ONONDAGA
CAYUGA
CORTLAND
OTSEGO
DELAWARE
GREENE
ULSTER
SULLIVAN
ORANGE
ROCKLAND
NEW YORK
RICHMOND
SUFFOLK
CHENANGO
BROOME
TIOGA
CHEMUNG
SCHUYLER
WAYNE
ONTARIO
YATES
STEUBEN
MONROE
ORLEANS
GENESEE
LIVINGSTON
WYOMING
ALLEGANY
NIAGARA
ERIE
CATTARAUGUS
CHAUTAUQUA

ACREAGE AND VALUE OF CUCUMBERS GROWN IN NEW YORK STATE, BY COUNTIES

(Taken from U. S. Census, 1910)

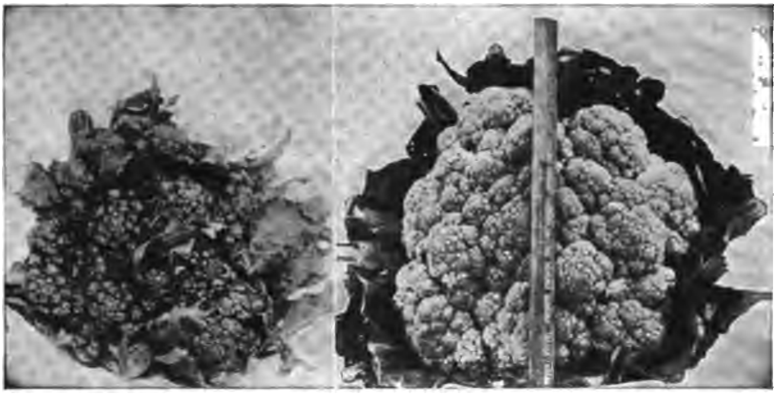
County	*Acres*	*Value*
Albany	274	$18,429
Allegany	....	....
Bronx	....	....
Broome	1	120
Cattaraugus	3	205
Cayuga	6	525
Chautauqua	4	450
Chemung	1	50
Chenango	....	....
Clinton	....	....
Columbia	2	350
Cortland	....	....
Delaware	....	....
Dutchess	2	300
Erie	408	33,914
Essex	3	225
Franklin	2	400
Fulton	2	330
Genesee	3	230
Greene	1	50
Hamilton	....	....
Herkimer	5	415
Jefferson	4	675
Kings	5	520
Lewis	....	....
Livingston	1	140
Madison	215	8,670
Monroe	156	15,537
Montgomery	24	2,122
Nassau	740	92.814
New York	14	1.385
Niagara	51	3.573
Oneida	33	2,682
Onondaga	140	$10,,307
Ontario	64	6,053
Orange	4	415
Orleans	3	151
Oswego	80	4,701
Otsego	....	....
Putnam	....	....
Queens	33	2,555
Rensselaer	13	793
Richmond	10	14,240
Rockland	52	3,695
St. Lawrence	....	....
Saratoga	12	805
Schenectady	14	863
Schoharie	....	....
Schuyler	....	....
Seneca	2	48
Steuben	....	....
Suffolk	509	84,631
Sullivan	....	....
Tioga	....	....
Tompkins	1	85
Ulster	5	251
Warren	2	100
Washington	77	4.351
Wayne	323	15.053
Westchester	44	4,614
Wyoming	2	14
Yates	....	....
The State	3.350	$337,841

CAULIFLOWER

A. E. Wilkinson

Extension Instruction, Department of Vegetable Gardening, Cornell University, Ithaca, N. Y.

Cauliflower probably was first grown in New York State in the home vegetable garden, and to a limited extent by market gardeners. About 1874 it was tried out at Peconic, Long Island, and a half acre there brought in about five hundred dollars. The following year many of the neighboring farmers tried out this crop, one who tried four acres realizing net two thousand dollars. The growing of the crop soon spread to other points, particularly toward Riverhead and out towards Orient. The total acreage in the state is 1,720 acres, of which 1,498 acres are grown on Long Island, the next point of importance being Erie County. There is a vast difference between the growing of cauliflower in these two localities.



(a) (b)

FIG. 444.—(a) A CAULIFLOWER HEAD AS IT IS LIKELY TO DEVELOP WHEN THE WEATHER IS TOO HOT AND DRY. (b) A TYPICAL HEAD OF EARLY CAULIFLOWER AS GROWN IN A FAVORABLE SEASON IN THE CORN BELT

CLIMATE

Cauliflower requires for its best development a moist, cool climate, especially if tempered with the air from neighboring bodies of water. Long Island is particularly well situated, having the sea air; and Erie County, Niagara and other counties near the Great Lakes have the advantages of these bodies of water. There are also other points in New York, especially along the Hudson, around the Finger Lakes, and near other lakes in the state, which are desirable places to grow the crop, because they meet the climatic requirements.

SOIL

The soil requirements for this crop are good drainage and a liberal, constant supply of moisture. Where moisture is deficient, the crop stops growing. Heavy loams are particularly adapted to this crop. On Long Island are found the heavy sandy loams, whereas in Erie County the gravelly and silty loams are used to grow the crop. Cauliflower is adapted to well drained muck and has met with considerable success where grown on this type of soil.

ROTATION

Rotation of crops is essential for the best results. Where club root, a disease of the roots, is common, cauliflower and other closely allied plants should be kept away from the soil for at least five years. The rotation on Long Island consists of growing a crop of potatoes or carrots preceding cauliflower and following the cauliflower with corn, rye, wheat or oats. The land may be allowed to stay down one or two years following this in clover or grass. In Erie County and other sections of the state where land is less valuable than on Long Island, a longer rotation is practiced, generally consisting of corn followed by cauliflower, then by grain, then by hay for two or three years or more. The important factor in both of these rotations should be the incorporation of humus in the soil and the avoidance of other cruciferous crops. On Long Island it would be advisable to practice a system of cover crops following potatoes and cauliflower, in order to keep the soil in better physical condition.

SEED

Most of the seed now used by cauliflower growers in New York is imported directly or through seed houses from Denmark.

Cauliflower men on Long Island, through the cauliflower exchange, import direct and sell their seed to the members of the association at a very low price.

VARIETIES

The varieties used mostly are Dwarf Erfurt and Snowball; about 90 per cent. of the latter.

In Buffalo and other sections of New York State the Snowball is the common variety used, although the Dwarf Erfurt is used to some extent. It is impossible to overemphasize the importance of good seed. Poor seed obtained from carelessly selected strains are sure to produce a loose, leafy, branching head of low value. The desired characteristic to obtain from seed should be a plant of medium to large size, producing in an ordinary season a head, the flower of which is from six to eight inches in diameter, heavy, symmetrical and solid. Dwarf Erfurt and Early Snowball will both give these characteristics, although the Erfurt makes a larger head than the Snowball under Long Island conditions.

The amount of seed necessary to plant an acre varies according to the care of the seed bed, number of plants required per acre, whether conditions and many other factors. An ounce of seed may ordinarily produce 2,500 to 3,000 plants, although the ounce may really contain over 10,000 seeds. On an average about 6,000 plants are required per acre. It would, therefore, require about two to two and one-half ounces of seed to plant an acre. Generally speaking, in planting it is best to allowed three ounces per acre, in order to be sure that enough plants will be available. The seed of cauliflower does not deteriorate quickly. It has been found that it is as good at two years or three years of age as at one, although a little thicker sowing is advisable with three-year-old seed. Beyond this point, the germinating power begins to decline rapidly.

RAISING EARLY PLANTS

In order to obtain an early product, it would be necessary to start the seed of cauliflower similar to the way in which early cabbage is produced. It is necessary, however, to exercise great care in the growing of early cauliflower plants. This increased care consists of having a soil which is only medium as to richness, not over watered, and freely ventilated. It is desirable not to hasten the growth of plants, but to produce a healthy, unchecked, moderate growth. The early seed is sown about March first. The seedlings should then be ready for the field May first to tenth. Cauliflower plants are more tender than cabbage, and, therefore, they cannot be placed outside until danger of hard frost has passed. Some growers practice the method of transplanting when the seedlings are very small, placing them two by two or two by three inches apart in beds or in flats. This extra space will provide free circulation of air. Cauliflower plants may be transplanted into paper pots, dirt bands, or other receptacles, and a much larger plant grown in this way; also seed may be sown a trifle earlier.

RAISING LATE PLANTS

It is customary to prepare a seed bed on the edge of the field similar to that for growing cabbage plants. The method has but one advantage, and that is, it is handy. It is much better to select a portion of land of greater value for the growing of the crop, particularly a piece of land that is not infected with disease, or if infected, that could be sterilized; also a portion of land that could be protected and that is near water. The land is generally plowed early and worked up very fine and level. The system on Long Island is that of using the planker followed by the Acme harrow, then the planker, then the Acme harrow. Some men instead of using an Acme harrow use a Meeker harrow. The numerous small discs on this harrow make it an excellent tool to finish the bed.

Fertilizer is then applied to the bed, the amount varying. Some men advise a 6–8–5 at the rate of a ton to the acre, others a 5–8–8 or 4–8–8, from one-half ton to a ton to the acre. From recent experiments tried out on Long Island, it seems that adequate returns can be obtained from 1,000 pounds of a 4–8–10 fertilizer, thus saving half the fertilizer where a ton has been used, and the seed is generally drilled in with a hand drill, the rows being spaced one foot apart. Two methods are practiced, one with two rows planted two feet apart and then two feet between the next pair of rows, and another method whic requires a solid bed of rows one foot apart. There seem to be very little difference in the plants produced. There is variation in the amount of seed to be used per rod, the differenc varying from an ounce of seed to five rods, to an ounce of seed t ten or twelve rods. Some men advise the use of one ounce o seed to 200 feet of drill. Where a large distance is given between plants, the plants grow short and stocky and have leave which are in the way when using the planker. When brough very close together, the plants are spindly and weak, and no desirable. So the best distance for planting seems to be an ounc of seed to about ten rods.

The depth of sowing should be carefully regulated, from one-third to one-half inch being deep enough. In order to preven crusting or baking of the soil over the seed, thus hindering it coming up, fine sand should be strewn along the row. If thi sand is dry, it will resist all attempt to bake. It takes from si to eight weeks to grow plants of suitable size for transplantin Generally this is about one week longer than for growing ca bages. The time of sowing the seed varies from the first of Ma to the middle of June. Where a late crop is desirable, even late plantings may be made.

It is quite advisable to make more than one sowing, becaus it offers an opportunity to choose the most favorable time fo transplanting. It also aids in forming a succession in the harvest, thus helping in a better distribution of labor. Clean cultur is necessary during the growing period of the plants, the soi being cultivated lightly two to five times to prevent crusting. I weeds develop in the row, it is best to remove them. At the tim of transplanting, the plants should cover the bed with a growt from six to eight inches high. The growth should be firm an stocky — a sappy, weak growth is not desirable. Careful watc should be kept for insects or diseases in the seed bed and suitabl remedies applied at this time.

TRANSPLANTING

The land used for transplanting should have been plowed earl In some cases on Lond Island a crop of early potatoes is grow first, followed by the crop of cauliflower. If this method is practiced, the land is worked very heavily throughout the season, and there seems to be no opportunity for a cover crop. In western New York the general method is to devote the land to the one crop during the season. The soil should be very finely prepared in order to facilitate transplanting. The best time to transplant is in cloudy or rainy weather, and if possible, more than one transplanting should be made. This will aid in lengthening the period of harvesting and in distributing labor. If a sunny day is selected for transplanting, the plants should be set only during the latter part of the afternoon.

On a large area machine planting is the system in vogue. With smaller areas hand planters are used. The machines greatly reduce the amount of hand labor and make the work more rapid. The stand is less perfect than with hand planting, and it is quite necessary to go over the patch by hand and reset. One or two hand planters on the market at the present time, according to figures, reduce the cost of planting, and in comparison with the method used, give better satisfaction than horse-drawn machines, especially on areas of five acres or less. On the large machines drawn by two horses, a barrel of water is carried, and at each click of the machine a half pint of water is delivered in the furrow. The clicking of the machine denotes the location of the plant, and the droppers, who are on the rear of the machine close to the ground, should place a plant at this time. Sometimes the water is allowed to run continuously because there is a variation in the placing of the plants. For the most successful work with the machine, the ground should be fairly dry. If the soil is wet, the machine does not work as well.

If hand planting is used, it is possible to mark out the field in two ways and place the plants at the intersection of the marks. The distance between rows should be three feet and the distance between plants in the row from eighteen to thirty inches. Plants set by hand can be cultivated both ways. Where the plants are located three feet apart between rows and thirty inches between plants in the row, it requires 5,808 plants for an acre. Wit machine planting, generally more than 6,000 plants are used

Whether the setting is done by hand or by machine, the plant should be obtained in the following manner:

Loosen the soil about the plants on both sides with a fork Slightly lift the plants from the ground, being careful to retai as much of the root surface as possible. Shake them dry. Di the roots in a pail of thick water made up of heavy soil and water This process is known as puddling. Place the plants in boxes roots down. If they are not running relatively even as t size, it may be best to select at this time, saving work on th planter. The best crops are obtained where plants are selected If the leaf surfaces are too large, it is a good plan to twist or cu them off slightly. They may be carried to the field in these boxe and distributed at convenient points.

FERTILIZERS

The amount of fertilizer varies with the system of farming On Long Island where the soils are deficient in humus, a large amount of fertilizer is used than at Buffalo. The Long Islan men are now employing fertilizer to the exclusion of stabl manures, in many cases much to their disadvantage. The successful growing of cover crops combined with fertilizer might tak the place of barnyard manure, but where poor cover crops ar grown, success is not forthcoming. At Buffalo the fertilizer use is generally a 4–8–10 or a 3–8–6, using from 750 to 1,500 pound per acre. On Long Island the fertilizer used is generally 6–8–5, although 5–9–6 and other formulas are in use. Th amount used on Long Island is much larger than that used nea Buffalo, generally from 1,500 to 2,500 pounds per acre bein applied. The fertilizer is made up as follows: one-half th nitrogen is derived from nitrate of soda, one-half from fish scrap acid phosphate from South Carolina rock, and in some cases whe fish scrap is not obtainable, from tankage, which is substitute for fish scrap; the potash is generally in the form of muriate

The Long Island men, being organized, are able to obtain goo fertilizers at a much smaller price. In one or two sections o western New York the same advantage is obtainable, because the men are realizing more and more that it is greatly to their advantage to organize.

Sometimes further applications of fertilizer are furnished. Bone meal, 300 to 400 pounds per acre, is often used; and one or two applications of nitrate of soda, 100 to 150 pounds at each application, are found valuable.

The method of applying the fertilizer varies, some men claiming that the best method is broadcasting, while others claim it should be applied in the row. Where cover crops and intense, up-to-date systems of farming are practiced, it may be desirable to place the fertilizer in the row. If the opposite is the rule, broadcasting should give better returns.

CULTIVATION

Cauliflower is a shallow-rooted crop, therefore cultivation should not be deep. It should commence as soon as the plants are set and be repeated very often. It is highly important that the plant does not suffer from drouth. Cultivation should continue as long as it is possible to get through the field.

TYING

It is necessary to protect the head or flower from exposure to sunlight. A perfect head of cauliflower should be dazzling white. Sometimes but a day or two of exposure will cause the head to become brown or purple. At first the leaves protect the head, especially when the flower is small. However, when the flower has developed to the size of a teacup, the leaves are pushed aside. Then artificial means of covering become necessary. The most common method of tying the heads is that of gathering the leaves together over the top of the head and tying with a piece of string, raffia or straw. It seems best to use different materials for tying, in order to distinguish between the different periods of tying. If on the first tying straw was used, the next time string should be employed, and the next time probably folding the leaves over the head and twisting the leaves from opposite sides, in order to hold these leaves in place, might be practiced. The grower will then know just which to cut first.

The length of time necessary for development of the head after it has been tied depends mainly upon the weather conditions, but it also depends on how well the factors in growing the crop have been carried out. If the field has lacked cultivation, do not expect the heads to grow very rapidly unless rains are frequent. Where conditions are correct, it has been found that in the hotter part of the season, two or three days will be sufficient. In the cooler days of autumn it will require from eight to twelve days to develop the head. Heads should be watched carefully, and when they become six to eight inches in diameter, should be cut. If left too long in warm weather, the leaves decay and discolor the head. In cold weather the heads begin to push up from the flower stalk, becoming undesirable, because they are irregular.

CUTTING AND TRIMMING

In cutting, it is seldom necessary to examine more than an occasional head for plants of any particular day's tying, because the plants of that tying will be ready about the same time. If, however, there seems to be an unevenness in their development, it will then be necessary to pry open the leaves of every head.

Cutting may be conveniently performed with a large butcher knife or hunting knife. The instrument will also serve for trimming. When the heads are to be cut, it should be done very carefully. They are seldom trimmed in the field, but are merely severed several inches below the flower and removed, leaves and all, to a packing house, where they are dressed and packed. It is necessary in cutting to have quite a portion of the stem and also of the large leaves remain with the flower, because in trimming the leaves are severed even with the sides of the flower and in such a manner that the whiteness of the flower is set off by the green frings. The leaves also serve as a protection. Where shipment of long cut flowers is practiced, the leaves are cut three to four inches above the flower, thus protecting the head efficiently.

There are three different types of trimming, the long and the short trim, both previously mentioned, and a medium between these two. The long trim is especially suited to distant shipments, protecting the snow-white heads from bruises, therefore disfigurement. It also enables the retailer to retrim the head and place it before the customer in a very desirable manner. The great disadvantage is the lessened number in a barrel or box and the heavier weight. The medium trim leaves the tops of the leaves just flush with the crown. It is particularly adapted for short journeys. There are more heads in each barrel. Short trim heads are generally covered with a small piece of paper to protect them. They are packed in a much better package than the other types, and return a higher price on the market.

PACKING

The common practice on Long Island has been to use a second-hand barrel, generally the sweet potato and the spinach barrel shipped from the South. These are unattractive, often dirty, unsanitary receptacles, and have lost favor on the market. Buffalo growers, by using a small, sanitary, attractive crate, have forced the Long Island men to adopt the same measures in order to continue shipping cauliflower to the same market. The packing of cauliflower in barrels consists of laying the heads right side up and as snugly as possible in the barrel, making the butts of each successive layer rest between the heads of the preceding. Another method consists of placing the heads out towards the sides of the barrel and inserting other heads in the middle. Generally from twenty to twenty-four heads of long-cut flowers fill a barrel. The barrel is crowned up eight inches above the top. It is then covered with a piece of burlap, often a piece of fertilizer bagging. Short-cut flowers packed in barrels require from thirty to thirty-five heads, and the medium from twenty-five to thirty. The barrel that sells the best on the New York market has been one containing about twenty-five heads.

The most satisfactory crate used has been one holding just twelve heads. A row through the middle of the crate accommodates four heads, flowers down, and on each side of this a row of flowers heads up. A slat is preferred and one which can be inspected easily by the association. A very desirable box is used by the Erie County Growers' and Shippers' Association, which consists of a slat crate with slanting sides holding from nine to twelve flowers, according to the size. The crate costs about fourteen cents. It is strong enough to prevent injury by expressmen o other rough handling; it will protect the flowers perfectly, and i is open enough to allow the inspectors employed by the associatio to thoroughly inspect each package.

One of the great advantages of using the crates is that o forcing the growers to grade their flowers according to size. Wit the barrel, grading is very seldom practiced.

MARKETING

The cauliflower crop from Long Island is moved by fast freight the railroad often providing special trains. These special train are put on whenever the shipments are large. A large amoun of the shipment, especially to distant markets, is made in refrigerator cars. The train leaves the east end of the island i the morning and arrives at Flatbush between six and seven in th evening. The barrels are then trucked to the consignee at Nev York City and go on sale early in the morning. The largest day' shipment known to the writer has been 10,000 barrels. A ca holds between 200 and 300 barrels, which are loaded on thei sides in the car.

Most of the flowers from Long Island are sold on commissio through the association, or are purchased outright. At Riverhead, the head office of the association, drivers come in with thei wagons, drive up to a platform, the auctioneer removes one o two barrels from the load, taking out the contents, and the loa is sold on the contents of those barrels. The auctioneer asks fo bids, and representatives of commission houses or the manage of the exchange bid on the barrels. If the price is too low, th manager raises the bids until they are sufficiently high, in thi way assuring a fair price to the grower.

In western New York the flowers are sold through the association, the association shipping to various cities according to order or wherever the manager thinks advisable. In some of the othe sections of New York the cauliflower is carried on the market i open trays or crates and sold directly by the individual hea the dozen, or the load, the flowers going to individuals, hotels, restaurants, stores and other places.

YIELDS, PRICES AND PROFITS

The expenses per acre of growing the crop, according to the figures obtained by Cornell University, are as follows:

	Moderate	Liberal
Rent of land ($175–$200 per acre)	$15 00	$15 00
Plowing and harrowing	2 00	3 00
Seed, 2–3 oz	2 00	3 00
Seed-bed (labor and fertilizer)	2 00	2 50
Marking field and applying fertilizer	2 00	2 50
Fertilizer (1,500–2,000 lbs.)	22 50	30 00
Setting out plants	2 50	3 50
Cultivation (about six times)	4 00	5 00
Interests and depreciation on tools	2 00	6 00
Tying and harvesting	20 00	25 00
Packing, barrels, papers, nails and covers	20 00	30 00
Hauling to station	2 00	4 00
Total	$96 00	$129 50

The average yield per acre varies greatly according to the conditions. An average from thirty-four acres on Long Island was 111½ barrels per acre. Some of the high reports are 200 barrels, and from this it varies down to a very low yield. Good growers expect to get about 150 barrels to the acre in an average season.

The price of cauliflower varies widely, depending upon the size of the crop and the demands of the market. The early summer cauliflower generally brings from $3.50 to $4, falling from that to as low as 50 to 60 cents per barrel. The average price for cauliflower in crates in western New York was 72½ cents, about eleven heads in each crate. An average price from a great many growers on Long Island for several years has been from 85 to 90 cents per barrel. The average yield, taking the figures given previously, would return about $100 per acre.

It is safe to say in an average year, with a good fall, that a price of $200 per acre is about the amount which should be returned.

INSECTS

The cauliflower is troubled with several insects. The importe cabbage worm is one of the common pests. It eats large, irregular holes out of the leaves, generally working on the upper su face. It is readily reached by dust or spray. The cabbag looper, obtaining its name from the particular habit with which i moves, eats both on the upper side and the lower side of the leave The diamond back moth is a small caterpillar which works on th underside of the leaf only and does not eat through. It is ver difficult to control this pest because of its habits.

These leaf-eating insects are generally controlled by applic tions of spray material. The imported cabbage worm is be controlled by spraying with arsenate of lead early in the seaso and later, when the heads have formed, with such remedies pyrethrum or hellebore. Hot water at a temperature of 13 degrees F. will also kill every worm that is reached withou injuring the plant. The looper is most satisfactorily destroye by dry poisons. A pound of paris green mixed with a pound flour is sufficient to dust an acre, sifted on the plants early in th morning when they are wet with dew. The diamond back mot can be controlled by the use of an elbow extension rod or a angle nozzle to spray the under sides of the leaves with arsenat of lead, six pounds to one hundred gallons of water.

Cabbage aphis or louse are common pests, appearing ge erally in the seed bed. If not controlled, they multiply rapidl on the older plants. They may be controlled with nicotine sol tion applied to the plant, beginning early in the season. Wha oil soap is also a good remedy, one pound to six or seven gallo of water.

Cabbage maggot is often found on the crop. In the se bed it may be controlled by covering the bed with cheeseclot keeping out the fly that lays the egg which produces the magg In the field we have no well tried remedy to control this pe A new one just recommended is one-fifth ounce white arsen dissolved in one gallon boiling water, and one pint cheap molasse Spray on the leaves in large drops. The fly is attracted to th remedy and is killed by eating it.

DISEASES

Club root. This is a common disease in western New York and is becoming more common on Long Island. It is a swelling of the root caused by low organisms known as slime molds. The disease receives its name from the club-like appearance of the root system. Infection takes place through the root, and the organisms are able to live in the soil. The remedy is rotation of crops, keeping all closely allied crops away from the land for at least five years, and applying lime to the soil once every two or three years, or at longer periods. Care should be exercised not to bring the disease from the seed bed. Fields are soon rendered worthless in this manner..

Black rot. This is a common disease of the cabbage which is very destructive to cauliflower. Infection generally takes place through wounds, slowly working through the veins and involving the whole plant. The growth of the disease is marked by a yellowing or browning of the leaf from the tip backward and a darkening of the fibro-vascular bundles. The best remedy seems to be rotation.

Soft or stump rot. A common disease in seasons of hot and muggy weather. A wounded portion of the plant offers an opening for this parasite. The stem and inside of the head generally rots first. Rotation and liming the soil seems to be the best remedy.

Physiological trouble. Ricing is a physiological trouble probably resulting from renewed growth or pushing up of the flower heads, frequently caused by rain after a long period of drouth, especially where the plants have been standing still. Cultivation seems to be a good method of controlling this trouble. Additions of humus-making material to soil will also aid materially in increasing its water-holding capacity, thus helping to do away with the trouble. Bad seed selection may be another cause.

PICKLING

Cauliflowers are often grown for the pickle factory. There seems to be no difference in the culture from that mentioned for market, with the exception of harvesting. The flowers in harvesting are removed from the plant and the leaves taken from them.

The coral-like substance is the only portion sold. The yi per acre of flowers for pickling varies from three to tons. A good average yield is about five tons per acre. Ma growers of market cauliflower have an opportunity of selling th rice heads, extra large heads, or over-supply during years heavy production, to the pickling stations; thus realizing m from their crop than they otherwise would.

GROWING CAULIFLOWER UNDER GLASS

Cauliflower is grown under glass, particularly at Mattitu Long Island, in the fall of the year. The plants are placed in greenhouse early in the fall and given the same attention as t mentioned for outside with the exception that more care is ex cised regarding the moisture conditions. The flowers are allowed to produce as large heads as those grown outside. Th should be produced about Christmas time and from then on u the first of February. At this time small heads are sold at fr fifteen to twenty-five cents apiece.

It is particularly valuable as a fall crop with greenho vegetable men who are growing cucumbers and tomatoes a spring crop. The only competition of this crop at the particu time of year is from flowers grown in New Orleans and Califor

The time necessary to produce heads from seeds in the gre house varies from ninety to one hundred twenty days. A ho 50 feet wide and 320 feet long will accommodate about 2,7 cauliflower plants. At the same time lettuce plants may be int planted and it will accommodate three times as many of these

From eighty-five to ninety per cent. of all the cauliflower pla should form heads under proper management. Some very hi yields of flowers have been mentioned from various men enga in this line of work. The first quality heads sell at from fift to twenty-five cents a head, the second quality at from ten twenty cents and the third from five to fifteen cents. The f cost for growing the crop should not exceed $60 to $75; care of the house should be about the same as for lettuce or ot cool greenhouse crops; the cost of seed about $6 to $8; insura $20; miscellaneous about $75 — total, $221 to $253.

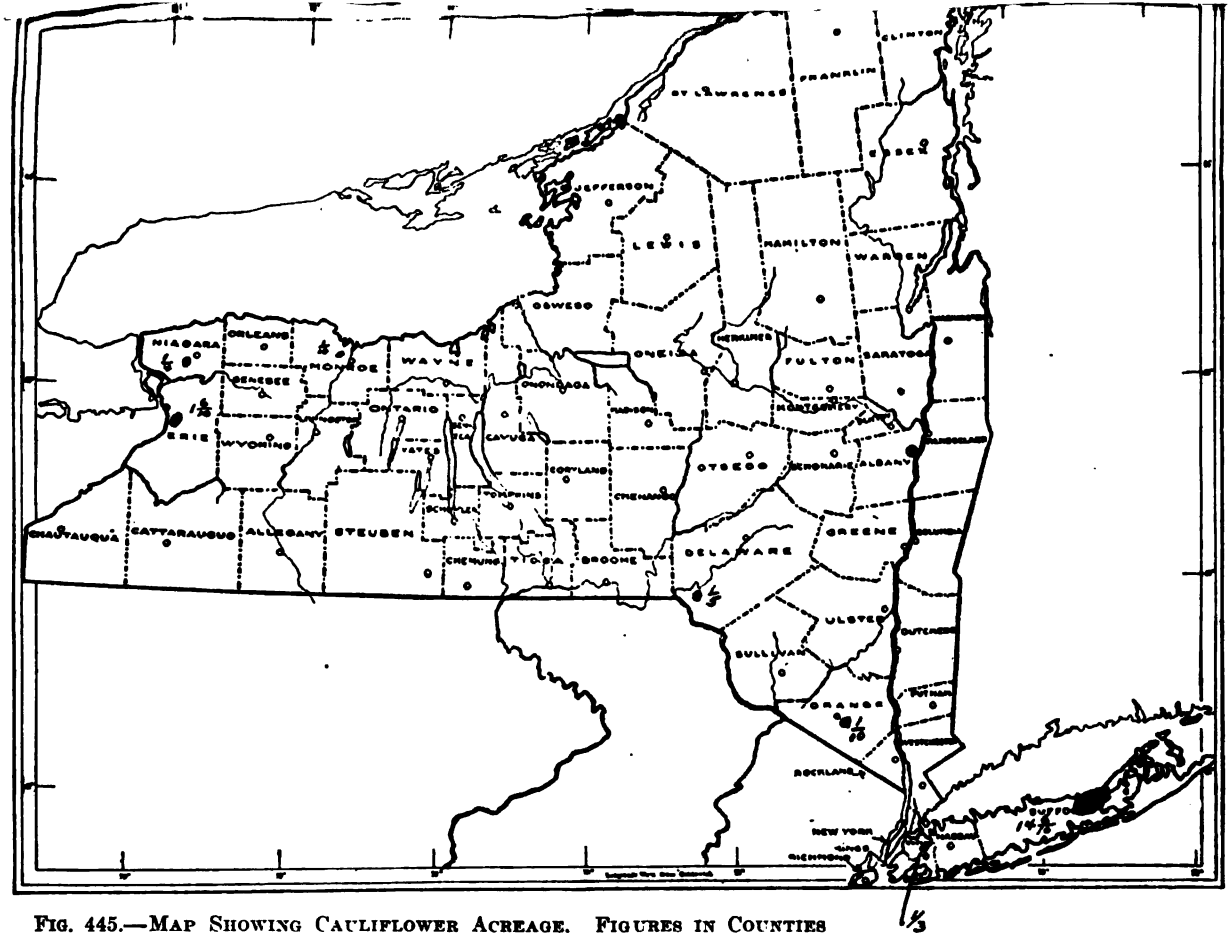


FIG. 445.—MAP SHOWING CAULIFLOWER ACREAGE. FIGURES IN COUNTIES REPRESENT ACRES BY HUNDREDS

ACREAGE AND VALUE OF CAULIFLOWER GROWN IN NEW YORK STATE, B COUNTIES

(Taken from U. S. Census, 1910)

County	*Acres*	*Value*	*County*	*Acres*	*Va*
Albany	2	$140	Oneida	2	$
Allegany	....	....	Onondaga	3	
Bronx	....	....	Ontario	....	.....
Broome	1	100	Orange	10	1.
Cattaraugus	....	....	Orleans	....	.....
Cayuga	....	....	Oswego	1	
Chautauqua	....	....	Otsego	....	.....
Chemung	2	90	Putnam	....	.....
Chenango	....	....	Queens	31	4.
Clinton	....	....	Rensselaer	....	.....
Columbia	1	300	Richmond	....	.....
Cortland	....	....	Rockland	1	
Delaware	18	7,170	St. Lawrence	....	.....
Dutchess	3	300	Saratoga	....	.....
Erie	158	26,723	Schenectady	....	.....
Essex	....	....	Schoharie	....	.....
Franklin	1	90	Schuyler	....	.....
Fulton	1	125	Seneca	....	.....
Genesee	....	....	Steuben	....	.....
Greene	....	....	Suffolk	1,462	285.
Hamilton	....	....	Sullivan	....	.....
Herkimer	....	....	Tioga	....	.....
Jefferson	....	....	Tompkins	....	.....
Kings	3	1,800	Ulster	....	.....
Lewis	....	....	Warren	....	.....
Livingston	....	....	Washington	....	.....
Madison	....	....	Wayne	....	.....
Monroe	9	1,583	Westchester	....	.....
Montgomery	....	....	Wyoming	....	.....
Nassau	2	880	Yates	....	.....
New York	....	....			
Niagara	9	1,320	The State	1,720	$338.

BRUSSELS SPROUTS *

Brussels sprouts are grown throughout the eastern end of Long Island, covering much the same section as cauliflower; but the industry is centered about Orient, at the extreme end of the Island. Cauliflower was once largely planted near Orient, and the soil appears to be quite as well adapted to the crop as farther west; but it has proved impossible, perhaps because of fogs, to grow as good cauliflowers here as about Southold and to the west, hence the growers have abandoned this crop for sprouts. Equally good sprouts can be raised west of Southold, but cauliflowers are deemed more profitable, and the industry is better organized.

Sprouts are grown on the same soils and sites as cauliflower, and for discussion of these topics the reader is referred to the preceding article on Cauliflower.

HISTORY

The first sprout seed sown in Orient was brought there by Captain Smith Dewey, a commission man who was a regular buyer at the east end of the Island, from New York in 1876. He secured an ounce of seed imported from Belgium by Mr. W. G. Ihrig, a New York commission man, and divided it equally between Mr. George W. Hallock and Mr. John Henry Youngs. Mr. Hallock discontinued the crop after one year, but Mr. Youngs has grown it uninterruptedly to the present time, though continuous and careful selection has so improved the stock that it now has little resemblance to the original.

The plants first raised were about three feet in height, or nearly twice that of the present strain, and had larger, though very firm, sprouts. It was customary in the early days to plant sprouts early, and this no doubt partly accounts for the difference in height.

Brussels sprouts were all but unknown on the New York market in the seventies, and Mr. Ihrig, who handled the slender Long Island product, found it slow work to build up a trade in them. Among his best customers in those days were Tom Thumb and his wife of Barnum's Museum, at Ann Street and Broadway,

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* **Reprint from Cornell Experiment Station Bulletin No. 292.**

and Mr. Ihrig soon began to call the sprouts "Tom Thumb cabbages," and sell them to clubs and hotels under this name. About 1880 three barrels shipped in midwinter by Mr. Youngs of Orient were promptly sold by Mr. Ihrig, who sent back a check for sixty dollars.

The region about Orient continues to be one of the most important sources of supply of this vegetable for the New York market, the crop now amounting annually to something like 300,000 quarts. The area planted each year is approximately 125 acres.

PREPARING THE SOIL. ROTATION OF CROPS

The preparation of soil and rotation of crops already described for cauliflowers applies equally well to Brussels sprouts. Late sprouts are grown as a succession crop following potatoes, or occasionally early carrots; for early sprouts the land is plowed in May and kept harrowed until time for setting the plants on new land. Sprouts are occasionally grown two years in succession but commonly three or four years are allowed to intervene between crops. No cruciferous crops, such as turnips, should be grown on the land meantime, as these serve as hosts for the club-root. Sprouts are commonly followed by potatoes, but frequently by corn or carrots; some then seed down to grass and so return to potatoes and sprouts. Some persons grow potatoes every year in the intervals between successive crops of sprouts.

Cover crops are commonly employed on the sprout fields. One of the leading growers finds timothy most satisfactory, broadcasting it in August over cucumbers or other late crops. The seed lodging on the leaves is washed into the soil by the first rain, and by winter the ground is well carpeted. Even if the top-growth is small, and the amount of vegetable matter appears trifling, when the land is turned over the soil near the surface is found to be densely filled with fine roots, and the texture of the soil greatly benefited. Another good grower will sow oats in August after potatoes, spread with 'bunkers' (mossbunkers or menhaden) during the fall, plow under and sow to rye for a winter cover. The next May the rye, then twelve to eighteen inches high, is plowed under and the land kept clean by harrowing till late June, when early sprouts are set. In the fall rye is sometimes sown among the sprouts, but the ground is then rather densely shaded to permit of a good stand..

RAISING THE PLANTS

The seed used at Orient is all locally grown, those who do not produce their own supply procuring it from their neighbors. The strain is very fine; its origin and characteristics are described later in the section on seed-growing. The seed bed is prepared on one edge of the field, the land it occupies being plowed and set with plants as soon as the rest of the field is finished. After the plot is made fine, and fertilized as for the crop, the seed is put in with a hand drill in rows eighteen to twenty-two inches apart, to make horse-cultivation possible. It is not wise to crowd the plants as much as with cauliflower, since any shedding of the lower leaves means loss in the early crop, as a sprout forms in each leaf-axil. With such spacing no hand-weeding is done; the weeds which grow in the rows are lifted with the plants and rejected as the latter are sorted.

Allow four ounces of seed per acre, and five weeks from seeding to produce plants of the proper size for setting. The sowing for the early crop is made from May 10 to 15, bringing the setting about June 20; and for the late crop from June 15 to as late as July 10. Three sowings are frequently made by the same grower at intervals of two weeks. The plants at the time of setting should be six to eight inches high, and stocky.

SETTING OUT THE PLANTS

For the early crop plants are set out in the latter part of June or early July, and for the late from July 20 to August 15, most of them going out about the first of August. Planting by machine has been tried by a number of growers, but practically all have fallen back on planting by hand as more reliable and giving better results. The machine would succeed under the proper conditions, but these it seems impracticable to meet. That is, when sprouts follow early potatoes the ground is very dry at setting time, and needs more thorough wetting than the machine affords. Then, too, to succeed with a machine one needs a heavy, slow and steady team, a skillful driver, and two careful and accurate men to ride behind.

The ground is marked in checks 3 x 2½ feet, or less commonly 3 x 3, or 3 x 1½ feet. The latter distance is too close. At the first named distance 5,808 plants are required for an acre. T holes are made with a hoe and soaked with water, and the m is plastered over the roots in the same way as already describ for cauliflowers. Twenty barrels of water an acre are requir for setting in a dry time.

FERTILIZATION AND CULTIVATION

A commercial fertilizer is always used on sprouts, though wh the latter succeed potatoes the same year the fertilizer is appli to the potatoes. If the land has been spread with bunkers t preceding fall, one-half ton of 4–8–7 fertilizer is sufficient on t potatoes; otherwise 1,500 to 2,000 pounds should be used. the land is saved for sprouts, the same amounts of the 4–8 or of the 6–8–5 are used just before setting. One grower obtain one of his best crops when he used three-fifths of a ton of Liste potato fertilizer and one-half ton of fish scrap, on land sav for the crop. The land was in sod the preceding year. The I. Thomas potato fertilizer, at one to one and one-fourth tons p acre, is also liked for sprouts. Every other year the land shou have a spreading of stable manure at the rate of 100 to 150 dum loads (16 to 24 tons) per acre.

Bunkers when obtainable cost $1.50 a thousand. They do n become so quickly available as fish scrap, but the blood and juic go into the soil, and the fertilizing materials come considerab cheaper in this form. It takes about 14,000 bunkers to make ton of fish scrap analyzing 10 per cent. ammonia and 6 per ce phosphoric acid, yet the scrap sells for $35 a ton,

Swamp muck from the salt marshes is being used on spro ground by one grower at the rate of ten spreader-loads per ac It is dug with a steam shovel, sprinkled with ground phospha rock, and shredded by running through a rotary ice chopper. T material, which is black as coal, consists of a mass of fine roots a ought greatly to increase the retentiveness of the soil; but it h not been in use long enough to demonstrate its value. A samp shows the following analysis:

	Per ce
Water	6.9
Organic matter	45.4
Nitrogen	1.2

	Per cent.
Phosphoric acid (P_2O_5)	.079
Potash (K_2O)	.586
Calcium oxid	.703
Chlorine	5.53

Shallow cultivation should be given after rains and about once a week in dry weather.

IRRIGATION

Irrigation of sprouts is being tried this year for the first time at the eastern end by Mr. L. H. Hallock of Orient. About an acre of sprouts are being watered by the Skinner system of overhead pipes set with tiny nozzles. The runs of pipe are 800 feet long and 50 feet apart, supported on pipe columns about 6½ feet high. A space 25 feet wide on either side of the pipe can easily be watered by this arrangement. The plants under irrigation were set out about August 15, following early carrots. They were well watered as soon as set, and have had waterings every week since, except when it rained. The water was allowed to run about five hours each time, amounting to half an inch. This sort of irrigation also has the advantage of knocking the lice off the plants.

HARVESTING

Harvesting begins as early as the middle of September from the plants set in June, but the shipments are light until well into October. Early sprouts should be picked over two or three times in the field, the lowest sprouts being taken each time, otherwise these will open out and become yellow, or rot if the weather is warm. The first picking must be done when the outer leaves of the lowest sprouts begin to turn yellow. In picking, the leaf subtending the sprout is broken away, so that when the time comes for cutting the plants the early ones will show from several inches to a foot of bare stem. As these lower leaves and sprouts are removed the plant continues to push up and form new leaves at the top, and the upper sprouts also fill out better, so that the yield of sprouts at the final cutting is about as great as though no picking had been done. When a sprout is ready to pick it readily breaks away from the stump; otherwise it clings tenaciously. These early sprouts are picked into bags and carried to the packing house or "sprout house," where they are packed in berry-boxes in the manner described in a following paragraph.

As freezing weather sets in, usually early in December, the plants are cut off near the ground with a corn hoe and hauled to some convenient place near the packing shed for stacking. A somewhat sheltered place, as an orchard, makes an excellent stacking ground, for the cold winds of winter are more likely to injure the sprouts than mere frost. The plants are stood upright on the ground as close together as possible, and a light covering of seaweed placed over them. A few inches of this material affords admirable protection, for it is too porous to cause heating, yet an excellent insulator. It should be dry when used. A covering of soil is much too heating. Freezing does not injure the sprouts if they are thawed gradually before handling, as in a cellar, but alternate freezing and thawing spoils them. A few growers trim off some of the lower leaves before hauling from the field, but most of them put the plants in the stack without trimming. The stacks are only one layer deep, and are commonly made about a rod wide, and as long as required.

After the plants are stacked the sprouts may be picked at leisure through the winter, adjusting the work to the markets and the steady employment of labor. The packing houses are provided with heat and light; when other tasks fill the day the picking is often done at night, from half past five to ten or eleven o'clock. Early sprouts especially are packed at night, the day being consumed in picking them. Upon being removed from the stack, the plants are divested of leaves and tops, and merely the stumps with sprouts attached are brought to the house. The pickers sit at a table with sprouts and berryboxes before them. The sprouts are removed from the stump with a small knife, such knives as paring, budding, shoemakers' and jackknives being variously employed for this purpose. It is usually necessary to cut through the leaf-base in order to sever a sprout. The stumps are found to be good feed for stock, and are largely employed for that purpose. The sprouts having been removed from the stump, they are "shucked" or freed from the outer dry or yellow leaves, and placed in quart berry baskets, the looser heads going into the bottom, and the smooth, firm ones on top, allowing a crown of an inch or two above the rim of the box. Little attempt is made at sizing, but occasionally the small hard sprouts are packed by themselves.

In the earlier part of the season, when the sprouts run larger and with fewer culls, the common price paid for picking and packing is two cents a quart; and at that rate a man working an evening from 5:30 to 11:00 can sometimes make $1.25. If the sprouts were poor he could not make over two-thirds of this amount. In the winter the pickers often insist on being paid by the day, the common rate being one dollar, but a good picker can usually do better at piece-work, for he can average two bushels or sixty-four quarts a day.

When the boxes are packed they are set in 32-, 48-, or 60-quart crates for shipment, the second size being the favorite for all but the earliest sprouts, which seem to sell a little better in the smallest package. The 60-quart package is a little too large for market requirements, moving a little slowly, and is now almost entirely abandoned for the 48-quart, on which the express charge is relatively less than on the 32-quart crate.

Sprouts are picked all winter, the very last of them going to market as late as April first; but nearly everything has commonly gone by March first. Mr. L. H. Hallock has tried freezing sprouts by embedding them in cracked ice, in order to hold them for the spring market, but found it impracticable to keep them frozen in an ordinary icehouse. With mechanical refrigeration the matter would be simpler, and doubtless will soon be employed. The frozen sprouts come out in excellent condition when thawed gradually.

YIELDS, PRICES AND PROFITS

Two thousand quarts per acre is considered a fair yield for late sprouts, used as a succession crop, but the best growers will not infrequently harvest as many as 2,500. In the case of early sprouts, when the land has been saved for them and part of the crop harvested in the field, 4,000 quarts can be picked, but this is more than ordinary. Even as high as 5,500 quarts have been raised on an acre.

The price per quart ranges from as low as four cents to as high as twenty-five. The prices previous to Thanksgiving are commonly low, but advance with the winter season till they reach their highest late in February or early in March. The average price is perhaps somewhere between ten and fourteen cents. One large grower found that an acre of early sprouts in 1908 brought a gross return of $400, the sprouts selling at fifteen to sixteen cents a quart. A return nearly as great is not uncommon with late sprouts.

The expense of producing an acre of sprouts is approximately as follows:

	Moderate.	Liberal.
Rent of land ($175 — $200 per acre)	$15 00	$15 00
Plowing and harrowing	2 00	3 00
Seed, 3 to 4 oz	1 80	2 40
Seed-bed (labor and fertilizer)	2 00	2 50
Marking field and applying fertilizer	2 00	2 50
Fertilizer (1,500–2,000 lbs.)	22 50	32 00
Setting out plants	2 50	3 50
Cultivation	4 00	5 00
Interest and depreciation on tools	2 00	4 00
Harvesting and stacking	8 00	12 00
Picking and packing	40 00	75 00
Crates and nails	20 00	30 00
Hauling to station	4 00	8 00
Total	$125 80	$194 90

The sprouts grown at Orient are all hauled to Greenport (four to five miles), and shipped to New York by express. The express charge on a 32-quart crate is 35 cents, and 45 cents on a 48-quart crate.

INSECTS AND DISEASES

These are the same as those which attack the cauliflower, and have already been dealt with in the preceding article.

SEED-GROWING

Selecting mother plants. Just before cutting the plants, or picking the bottom sprouts in case this is done before cutting, a competent person should go through the field to select the seed plants. Two rows can be examined at a time, and the plants as selected can be pulled and thrown between the rows. Later the plants from four rows can be thrown into one, and left to lie until the crop is harvested or freezing is threatened. The person selecting the plants should have clearly in mind the ideal, and select only those which approach it much more closely than the average of the field. Among the most important characters to be sought are the following:

1. Hard, firm, medium-sized sprouts.

Close, compact arrangement around the stem, completely covering it from the ground well up to the head.

3. Medium height. Too tall a plant exposes the sprouts more to frost.

4. Small head or rosette at top.

5. Dark green color. Such plants are more resistant to frost.

Storing the plants. When the advance of winter makes it necessary to protect the mother plants, they are trimmed by removing the lower leaves (the upper ones must be left to insure good growth the following season) and are placed in a shed, cellar or trench. Most growers now prefer a shed or barn, as cellars generally prove too warm, and trenches do not admit of easy examination, or the removal of decaying plants. The storage building must be sufficiently tight to prevent the plants freezing, for though a slightly frozen plant may produce a good seed stalk so long as the head of the plant is not frozen, its vitality is likely to be weakened, and the danger to the head itself is too great. On the other hand, it is very important to keep the plants from heating, for yellowing of leaves and decay quickly follow a mild temperature. Neither must the plants be allowed to grow. Ventilation must be provided for, and the doors and windows opened whenever the outside temperature is above freezing.

The plants are best heeled-in in shallow trenches, setting a double row and leaving an interval of about ten inches between the double rows. This permits free circulation of air, and is much better than crowding all together in a compact mass, as when stacking to cover for the winter market. Occasionally a pail or two of water should be thrown over the plants to prevent too much drying of the soil. The plants should come out in the spring as bright and green as when they went in, without signs of yellowing.

Plants stored in cellars are troublesome to handle, because i difficult to secure proper ventilation and control the temperat The heat and moisture are likely to cause yellowing, if not do right decay. Such conditions also favor the white mold (*Al naria brassiae* (Berk.) Sacc.) the most dreaded of all stor troubles. Once it has a foothold it destroys swiftly and sur The sprouts near the base should be removed, for they usually if left, and sometimes cause the stump to rot.

Sheds with the floor about two feet below the surface of ground are found to be desirable for storage. One grower such a house 12 x 65 feet, the walls being insulated with a inch layer of seaweed. In setting the plants a path is left thro the center. Since so many plants are handled, this grower c not take time to trim off any of the leaves, but finds it necess to pick off the yellow leaves about the first of March, or earlie the weather has been warm.

The plants can also be wintered in trenches. It is the prac to dig a trench a little wider than a spade, and deep enoug that the plants will come just flush with the ground when st up in the trench. The plants are then packed in it in a dou row, so that the trench is completely filled. No covering is put at any time. One grower who recently stored about fifty pla this way brought only about half through to actual seed-bear

Cold frames are also successfully used for storing.

Setting out. As soon as the ground can be prepared in spring (usually from the first to the tenth of April) the pla are set out in rows about three and one-half feet apart, and al two and one-half feet apart in the row. The sprouts soon expa and a few of the large ones near the base will produce flowe shoots, but the chief growth is made from the terminal bud. tall, branching flower stem is thrown up from this bud, and first mature seed pods appear in the latter part of July. ripening is uneven over the field, and even on the same plant that no method of gathering is feasible other than picking hand. The seed-stalks are clipped with small shears and crow into a barrel which the picker carries along. This receptacle little cumbersome, but effectually prevents any waste by the evitable shelling out of the seed. The seed stalks are pressed and trod into the barrel until it can hold no more, and it may then be set aside until a convenient time for cleaning the seed, in case the stalks are very dry; but usually it is safer to remove the stalks from the barrel and dry them in the sun for a few days, spreading them on a blanket or canvas. The pods are then readily stripped from the stalks by drawing through the hand, and this same operation shells practically all the seed from the pods. The seed is readily shaken to the bottom on the blanket or in the barrel, and easily cleaned by pouring from a pail when a breeze is blowing. This seed is obtained a little too late for planting in the same season, and is used nearly a year later. Two-year-old seed is frequently used in event of the failure of the seed crop, for most growers retain enough annually to provide for such an emergency. The older seed germinates a little more slowly than the fresh, but is otherwise just as good, and the extra day or two is of no moment.

Under no circumstances would one of these growers resort to the ordinary stocks of seeds on the market, as these have been tried repeatedly in a small way, and always proved disappointing; the plants have usually been tall and vigorous, but with only a few soft, scattering sprouts, or none at all. The Long Island seed is immensely superior to the ordinary and undoubtedly the best in the country, if not in the world. It is apparently too high-priced for the dealer, bringing locally fifty to seventy-five cents an ounce, while the prevailing wholesale price elsewhere is about fifteen cents. It is scarcely necessary to add that the seed is easily worth the difference. It used to bring sixteen dollars a pound. One hundred plants will in good season produce ten to fifteen pounds of seed, or at the rate of 500 to 750 pounds per acre.

CELERY

HENRY GREFFRATH, LIMA, N. Y.

President, New York State Vegetable Growers' Association

The demand for celery in this country is constantly increasin
but the increased acreage planted each year and the quality a
condition in which celery is marketed, with present methods
distribution, fully meet the demand at the present time. I
not make this statement hoping to discourage any one from ente
ing into the growing of celery, but I do wish to impress up
everyone thinking of entering the business, and those already e
gaged in it, that the future prosperity of this industry depen
on the quality of the celery grown and the condition of it whe
marketed, as well as on the method of distribution.

The climatic conditions of this vast country of ours are not t
same in all localities; therefore, one set of rules for the growi
of celery can not be applied to all sections.

The writer has been engaged in the growing and shipping
celery for the past thirty years in New York State, and will try
give the public what he had found to be the best methods for th
part of the country.

SELF BLANCHING IN GREATEST DEMAND

The celery in greatest demand at the present time is a varie
known as Self Blanching although in some cities the Green Gold
Heart type is used to some extent. Self Blanching is the han
somest celery, when properly grown, of all known types, but it
also more subject to disease than any of the other types a
demands great care from the time the seed bed is started un
the crop is placed before the consumer.

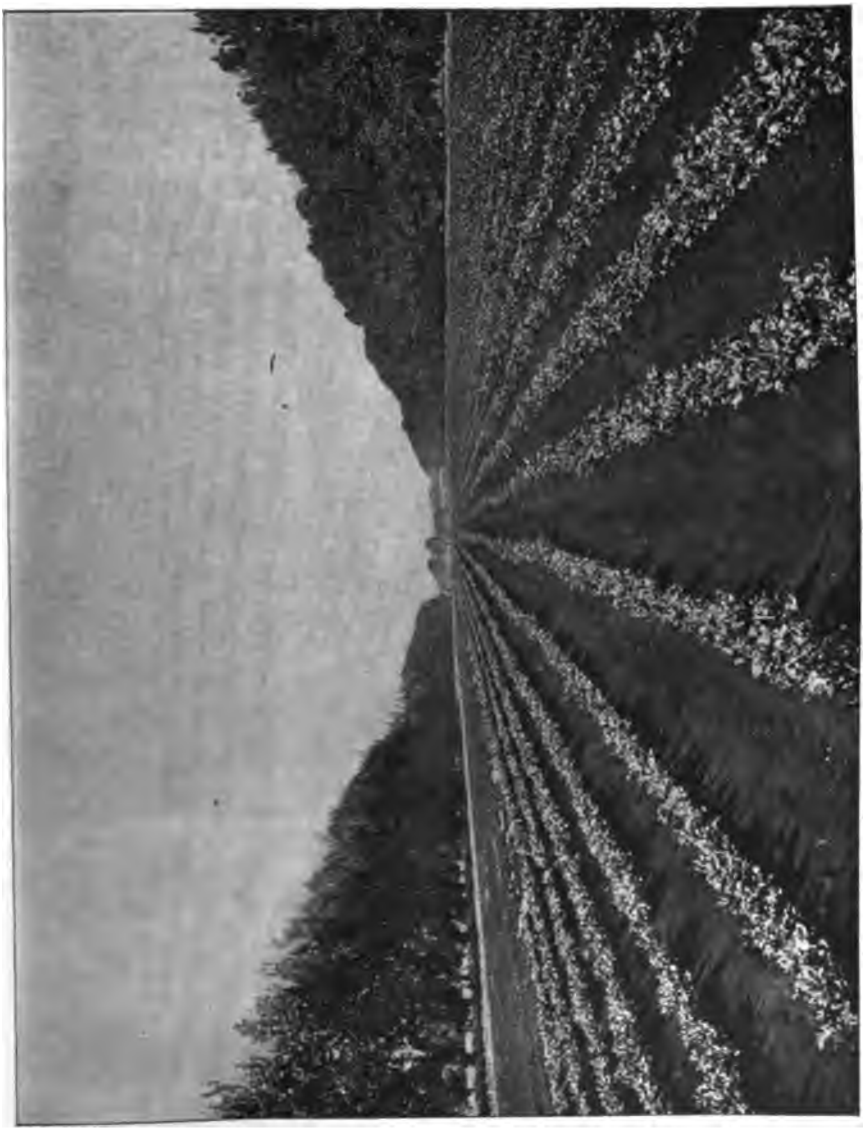


FIG. 446.—CELERY ON MUCK LAND. ALSO SHOWS WINDBREAK

GROWING EARLY CROPS

If one wishes to market his crop in the month of July, he must start the plants in a greenhouse, sowing the seeds March 1. I find that I can get stronger plants from beds in which the seed is sown broadcast than from sowing in rows. A grower should endeavor to sow the seed so that there will be from 200 to 250 plants to the square foot. If too thick, thin them out.

The seed bed should be made of the best soil available. I use muck only and have used the same muck in my greenhouse for the past fifteen years. Keep it free from all kinds of disease by sterilization and spraying. Never cover the seed with more than one-quarter of an inch of dirt and never let the seed bed become dry from the time seed is sown. Do not give too much water, for, if too wet, soil under glass will become sour and moss covered, and the plants will not do well.

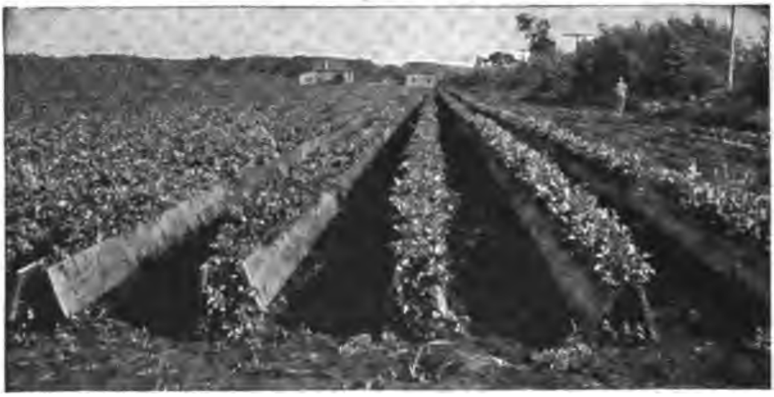


FIG. 447.— BLANCHING THE EARLY CELERY CROP WITH BOARDS

Plant in the field just as soon as the season will permit. A light frost will do very little harm to celery if it is well planted and the land is wet, but will spoil celery plants if the ground is dry and they have not taken root.

Celery plants set May first should be ready to bleach by July first. I use lumber for bleaching and find that the celery is in a much better condition when bleached with boards than when paper is used.

Self-blanching celery seed has about 20,000 seeds to the ounce, but one can not count on more than 5,000 good plants to the ounce.

In growing early celery great care must be taken to keep the water level of the land down during the months of May and June so as not to force the roots of the celery to grow too near the top. On wet land the roots will be forced so near the surface that the fine rootlets will grow upward and out of the ground. It is impossible to keep a field of celery in good growing condition during the months of August and September, when the ground usually becomes hot and dry, if the water level was too high during May and June. Keep the land well drained and cultivate deep during wet weather, thereby forcing the celery roots deep down into the soil, and the crop will stand a long period of dry weather. But if roots are near the top during dry weather the crop is sure to be checked badly and may be entirely spoiled by the heart turning black.

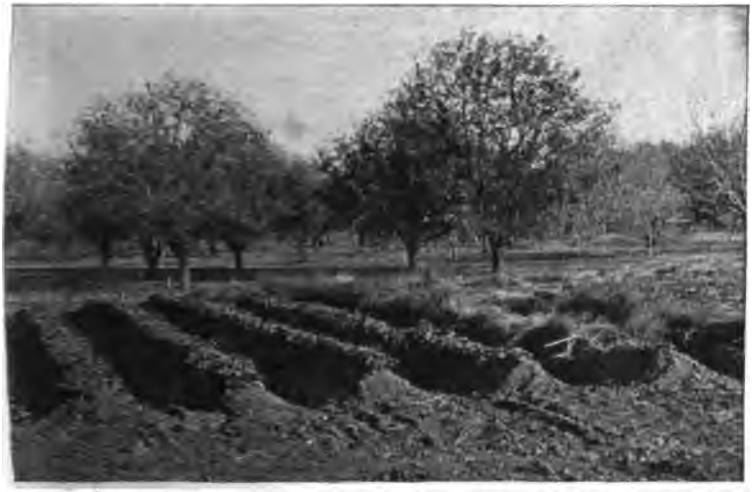
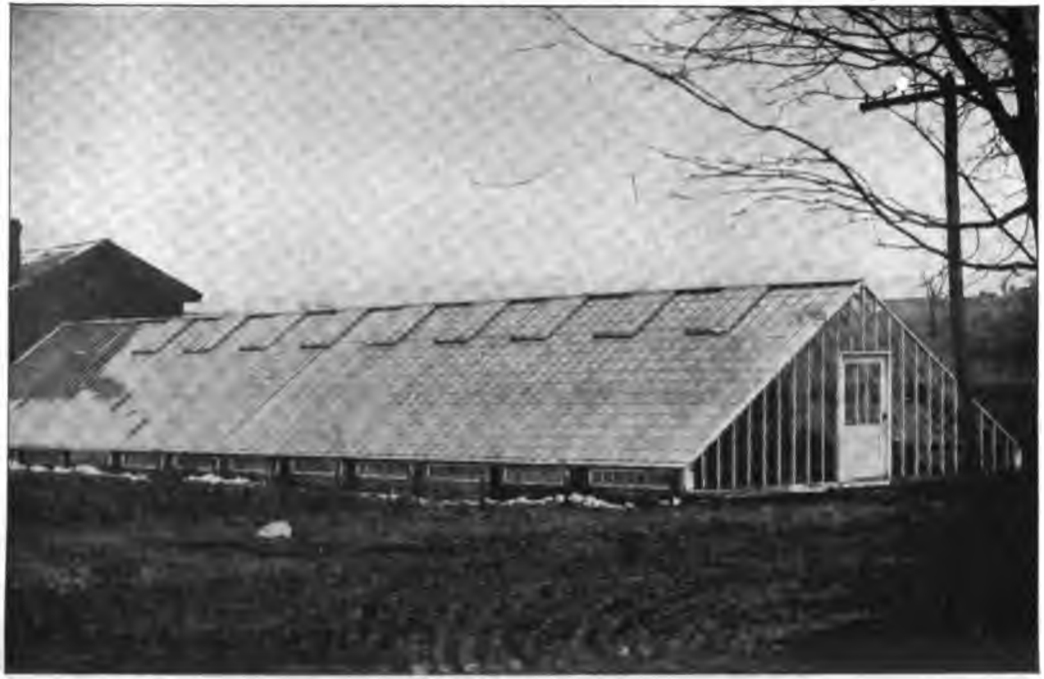


FIG. 448.— LATE CELERY BANKED WITH EARTH FOR BLANCHING

THE LATE CROPS

The plants for the fall or late crops should be planted in the fields from June second to July tenth. If the land is dry when planting, wet it well before and after the plants are set.

The late celery crop should be planted in rows three and one-half feet apart, plants five inches apart in rows.



There will be little trouble in keeping the roots of the late celery working downward as it is usually dry during July and August when the root growth of the late crop is being made, and nature causes them to go down for moisture. I have never seen much black heart in late celery, but if planted before July fifteenth it is apt to be so affected if the fall is dry.

The seed for a late crop should be sown in the open field from April tenth to May tenth. Protect the seed beds with wind breaks to keep the cold spring winds from sweeping over the beds, and keep them wet until the plants have four leaves. After that they will get along very well if the beds are not located on too dry a spot. I sow my outdoor seed beds broadcast making the beds five feet wide with a path of eighteen inches between. My early celery crop is planted in rows eighteen inches apart, plants set five inches apart in the row. One should not try to grow early celery unless he has good irrigation.

IRRIGATION AND DRAINAGE

I use the Skinner system of irrigation and would not be without it, but a grower should learn how to use it on a small scale before trying to grow a large acreage with it. A great many growers condemn the system because they do not know how to use it.

Celery requires a large amount of water during the growing season, and, unless one can give it the amount needed, he will not get the best grade of celery. The land must be drained perfectly. I use tile for drainage and have a six-inch tile ditch every seventy-five feet, placed thirty inches below the surface.

FERTILIZER

Two tons of high-grade fertilizer 4–7–10 and one-half ton of fish tankage per acre is to be recommended for early celery, sowing one ton per acre and working it into the land before the crop is planted. The remainder of the fertilizer and tankage is sown as a side dressing while the crop is growing, making about three applications — the last one about three weeks before the crop is to be harvested.

On my late crop I use about one ton of high-grade fertilizer 4–7–10, sowing one-half ton before planting, and working it well into the land; and sowing the other half ton as a side dressing in two applications on each side of the row, using care not to get any of the fertilizer on the plant. It will burn the foliage and if it gets down into the plant will spot and rot the stalks. Keep the cultivator in action from the time the celery is planted in the field.

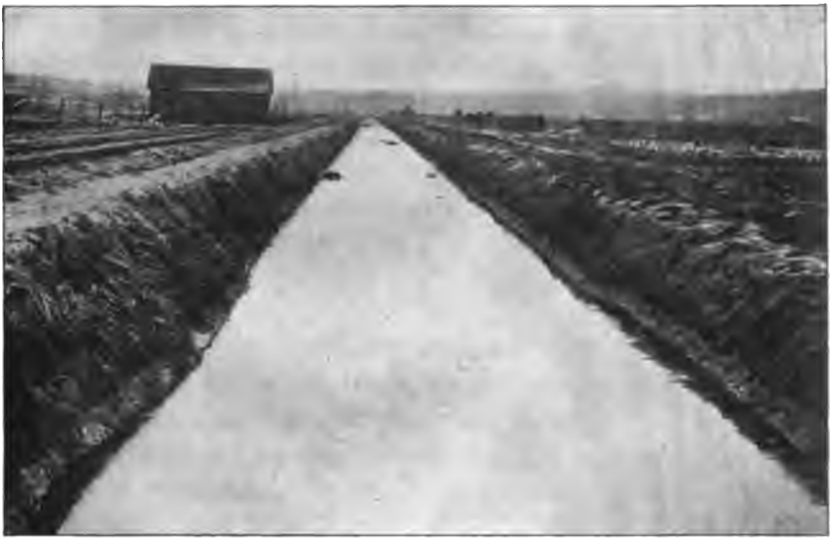


FIG. 450.— SLATE DITCH AT SOUTH LIMA, N. Y. CELERY LAND ON EITHER SIDE

COST OF GROWING CROPS

It costs about $375 to grow, harvest and ship an acre of early celery. The sale per acre for early celery will run from about $700 to $1,200, according to market conditions when harvested. The cost of growing, harvesting and shipping an acre of late celery is about $150. The average yield per acre is about 200 crates. Prices paid for the fall crop in 1913 ran from $1.25 to $2.00 per crate, while prices paid in the fall of 1914 ran from .75 to $1.35 per crate. There is not much money in late celery for the grower when such prices as paid in 1914 have to be accepted for the crop.

CONTROLLING BLIGHT

By spraying, celery blight can be controlled under all weather conditions, but the spraying must be done in the most thorough way and started when plants are young in the seed beds. I have seen growers applying bordeaux with a sprinkling can. They were wasting time and money, and damaging the crop. When bordeaux is applied with a sprinkling can or any other kind of a machine that does not make a very fine spray under a high pressure, the mixture will form in large drops on the foliage of the plants and run down the stalks, lodging at the root of the plant, as a result of which the consumer will find a large amount of vitriol in the celery. There are cases pending in courts now in which the health department claims celery was offered for sale that was unfit for use—the result of careless spraying. Even if the growers escaped paying this fine they have not helped the consumption of celery through their careless acts. Celery can be sprayed every week through the entire season and yet when harvested not have a trace of bordeaux show between the stalks of the plant next to the roots. But the mixture must be applied in a fine mist and under a high pressure.

IMPORTANCE OF QUALITY

The future prosperity of the celery industry depends on the quality grown, conditions when shipped, and method of distribution. I have made this a study for some years and am sorry to say that a great number of New York State growers seem to care little about quality. They want something that will give them the largest number of crates per acre.

A few words on the condition of celery and the way it is being sent to the market. Every celery grower in the East and South can learn from the California grower how to put up celery so as to have it appear at its best. California celery appears better than any other when it arrives on the market. This is not due to the fact that the celery is better than that grown in other sections. There is no section in this country that can grow a better stalk of celery than can be grown in New York State.

If we stop to examine the California celery to learn why it shows up so well after being in transit five or six times as long as our shipments are, we will find that every defective leaf has been taken off in the field; that the celery was carefully harvested and all the dirt removed from the roots — thereby keeping it clean — and that the crate was packed with uniform stalks on the outside and each one with the best face side of the stalk on the outside. We will also find that it is packed in a crate of good appearance.

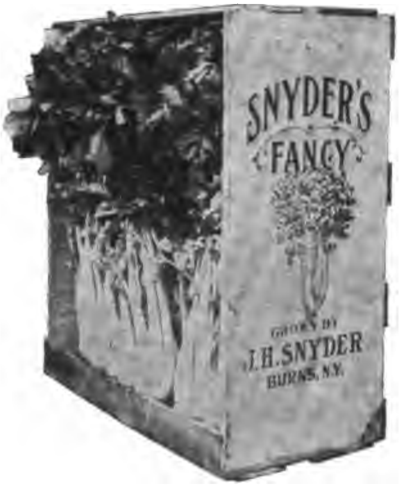


FIG. 451.— ATTRACTIVELY PACKED CELERY READY FOR MARKET

We can pack the same way and when we do we will be paid for it. I know of one instance where a dealer in one of our large markets paid a large sum each day for drawing away dirt and trimmings that should have been removed from the celery in the field before it was shipped. The grower must pay for this extra labor, and the sooner we come to understand this the better for us all.

SHIPPING AND MARKETING

We must also give more care to the loading of our celery when shipping by freight in refrigerator cars. Always use a crate that will load so that air spaces, each one three inches wide, will extend from one ice bunker to the other. Always slat the crate on the top so that the top crate will not drop into the lower one while in transit. Never let the celery become wilted before loading into cars, and start the car with temperature down. If it is warm in the car when loaded, cool by using salt on the ice in the bunker and when cool refill bunker with ice. Always mark the crates so that the trade can see who puts it up. A catchy name means nothing to the trade, but a good, honest package will bring the trade your way.

Now we come to the distribution. We send our celery to a few large markets and keep them glutted most of the time, while there are thousands of smaller towns that never receive a shipment from the grower. I am not in a position to state how to bring about better methods of distribution and hope that some one will soon find a way that will help us all along that line.

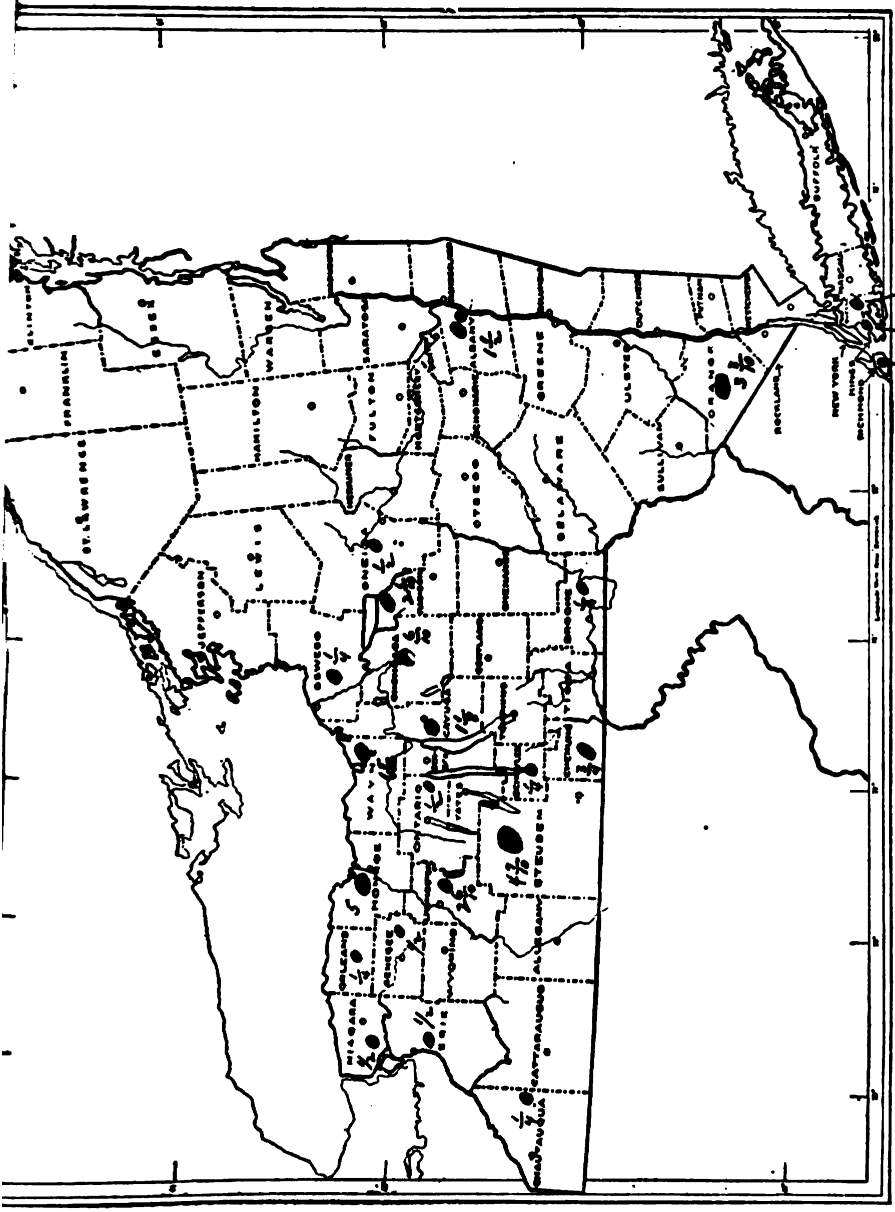


FIG. 452.—MAP SHOWING CELERY ACREAGE. FIGURES IN COUNTIES REPRESENT ACRES BY HUNDREDS

ACREAGE AND VALUE OF CELERY GROWN IN NEW YORK STATE, BY COUNTI

(Taken from U. S. Census, 1910)

County	*Acres*	*Value*
Albany	150	$28,379
Allegany	2	24
Bronx	....	....
Broome	20	5,111
Cattaraugus	4	500
Cayuga	116	14,758
Chautauqua	10	1,700
Chemung	71	14,449
Chenanga	....	....
Clinton	....	....
Columbia	4	1,640
Cortland	5	2,084
Delaware	....	....
Dutchess	5	890
Erie	47	10,196
Essex	....	....
Franklin	....	....
Fulton	4	1,200
Genesee	46	12,001
Greene	2	893
Hamilton	....	....
Herkimer	1	300
Jefferson	9	3,425
Kings	45	7,550
Lewis	....	....
Livingston	259	77,656
Madison	211	34,215
Monroe	498	145,047
Montgomery	....	....
Nassau	16	5,750
New York	14	3,435
Niagara	44	12,025

County	*Acres*	*Va*
Oneida	35	$6,
Onondaga	56	11,9
Ontario	49	13,4
Orange	329	290,3
Orleans	5	1,4
Oswego	1	8
Otsego	4	1,6
Putnam	....	......
Queens	159	32,2
Rensselaer	3	4
Richmond	47	17,3
Rockland	....	......
St. Lawrence	....	......
Saratoga	1	4
Schenectady	....	......
Schoharie	....	......
Schuyler	....	......
Seneca	16	5,0
Steuben	468	145,6
Suffolk	1	2
Sullivan	....	......
Tioga	3	9
Tompkins	1	2
Ulster	7	1,1
Warren	....	......
Washington	1	3
Wayne	151	32,4
Westchester	4	3
Wyoming	....	......
Yates	2	
The State	2,926	$946,4

ASPARAGUS

C. C. Hulsart, Matawan, Monmouth County, N. J.

INTRODUCTION

The popularity which asparagus has achieved within the last two or three decades is marvelous. Thirty years ago or less, this vegetable was a luxury found on the tables of the rich; it is now found on the tables in almost every home, even those of small incomes. It is frequently recommended as an article of diet for the sick and convalescent.

The fact that asparagus appears in the market at a time of the year when few or no other fresh vegetables are available has had much to do with its increased consumption in our cities. It can also be preserved by canning, being in this form almost equal to the fresh article. This has increased its use, thus lengthening the season.

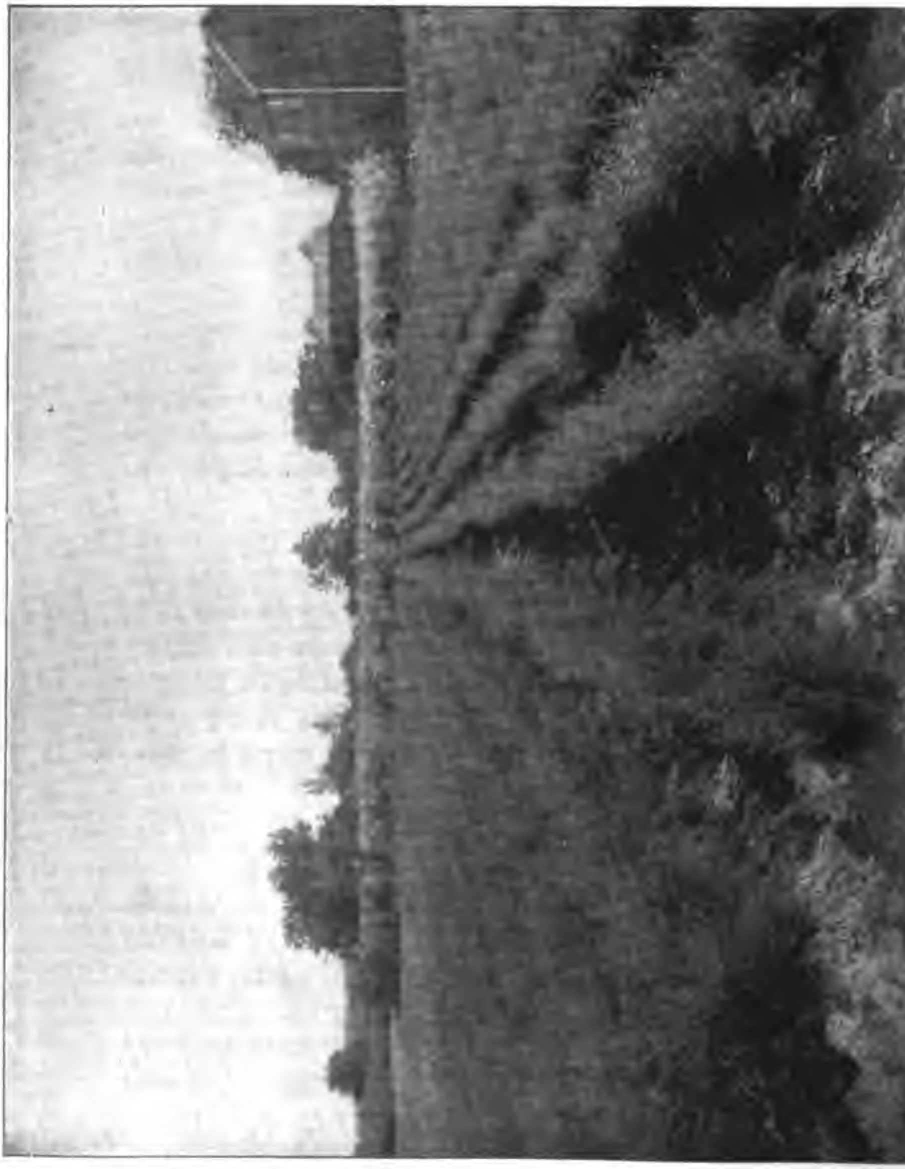
Within the last few years the cultivation of asparagus has been greatly extended, yet the demand is still greater than the supply except in and near large receiving centers, indicating there is room for more extended plantings remote from such centers. Every kitchen garden should have its bed, from which the table may be supplied, and many small farmers could supply themselves with much needed cash by growing this vegetable where their farms lie adjacent to a town or village.

HISTORY

The use of asparagus is almost as old as the hills and marshes on which the ancient writers say the two varieties of their day grew. First as a medicinal plant and then as a vegetable it was known to the Romans.

Writers of those days praise its virtues with enthusiasm and the epicure counted it one of the delights of his table. For want of a better way, the sprouts were preserved by drying. This is done yet by some.

So far had the gardeners of that day progressed in its im-



provement that Pliny was able to record spears of it weighing three to the pound.

Once made familiar with the use of the native article by the invading Roman soldiery, the Gauls, Germans and Britons appreciated its value, and it soon became one of their most prized vegetables. Early writers on horticultural subjects leave no room for doubt that as early as the first part of the sixteenth century — four hundred years ago — the use of asparagus was not only general in nearly every part of Europe, but that in some parts its development was such as to put the so-called "colossal" and "mammoth" of the present day upon their mettle, since spears weighing over one-half pound each were not of uncommon occurrence.

In France, Holland, Germany, Hungary and England, asparagus was both gathered by the peasantry in its wild state and carried to the towns for the tables of the prosperous burghers and grown in the landlord's gardens for his own table.

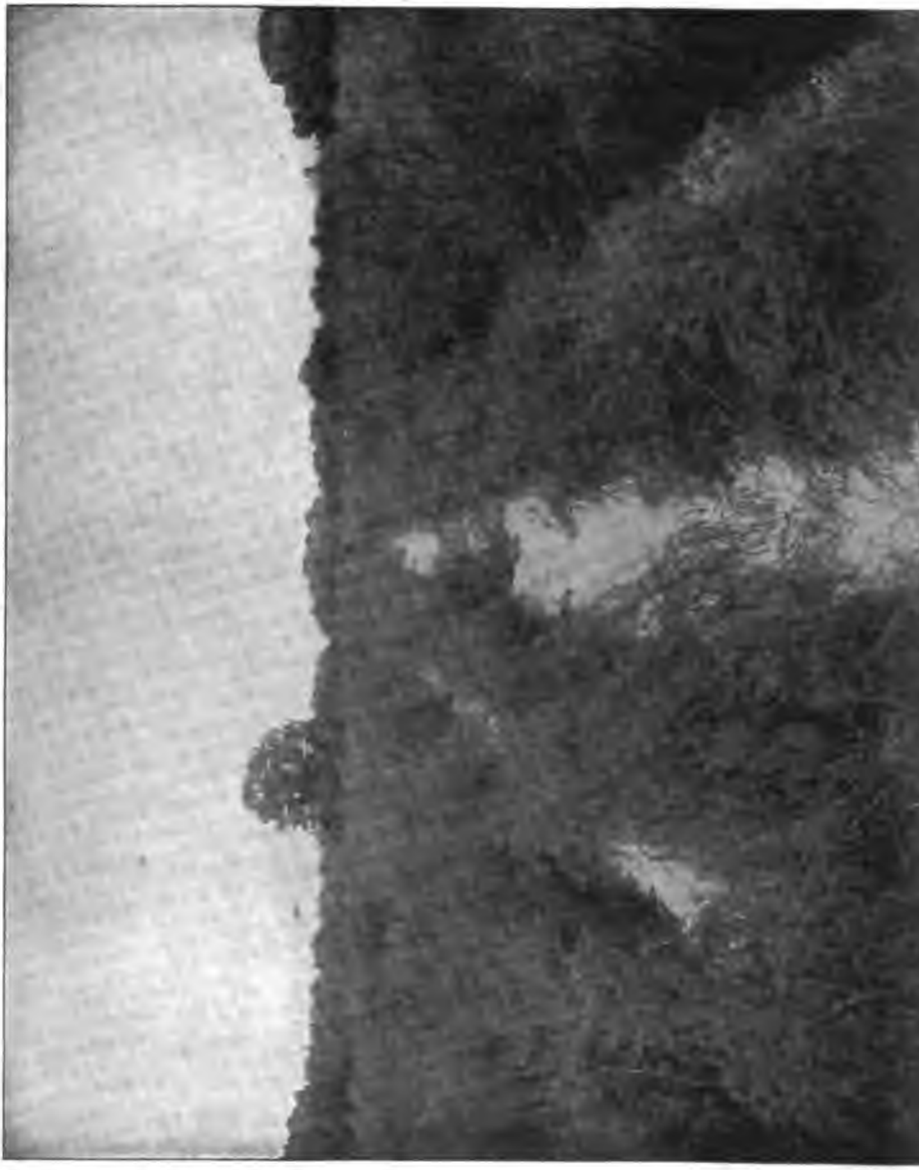
The early settlers of America, familiar with its use, brought the seed of the plant with them, and, though not native to this country, it found the climate congenial.

Although a "cosmopolitan" there are localities where its skilful culture has produced such results, both as to size of spears and average yield, that they are noted the world over as asparagus growing centers. Many of the states of the eastern coast from Charleston, S. C., to Boston, Mass., of the Mississippi Valley, and of the Pacific Slope, produce a great amount of asparagus, but it is on Long Island and New Jersey that much attention has been given to its cultivation, and there its culture has reached a high state of development.

BOTANY AND VARIETIES

The genus asparagus belongs to the Lily-of-the-Valley family. It includes about 100 species, all native of the Old World. A few species, including the familiar asparagus vine and the smilax of the florist, are in common cultivation for ornamental purposes, but most of them, having no recognized economic value, are known only to botanists.

All the various forms and varieties of the vegetable now in



common cultivation under the name of asparagus, and sold in the market as "grass," have been derived from one species, *Asparagus officinalis.*

Although but one species is to be found in cultivation there are many so-called varieties. Thus we have Colossal, Barr's Mammoth, Donald's Elmira, Palmetto, etc., in our own country, besides the numerous varieties cultivated in France, Germany, England, etc., when in reality there are but three or four of them, all of which deserve to have special names, being nearly all susceptible of classification under the general head of "Giant" or "Mammoth," indicative of the improved size produced by the superior conditions of manuring, soil, climate and cultivation, to which they have been subjected.

PRODUCTION OF PLANTS FROM SEED

For the asparagus grower there are two methods by which plants can be secured: first, by purchasing or saving the seed by which to raise them, and, second, by purchasing the plants from a seedsman or some grower. Taking the second method as the easiest and quickest way to start a bed it is suggested that the purchaser be very discriminating in what he accepts and who he accepts it from. He should know the variety he wants to plant, should allow no substitution, and accept good one-year-old roots only. Too many beds have been failures because of this oversight.

The first method is by far the surest where time can be allowed and care given to growing the young plants from seed. In using this method the first requisite is good seed. It is not sufficient to know that the seed will germinate and grow; it should have prepotency. In order to secure this kind of asparagus seed care must be exercised either by the seller or the grower himself. This is rarely ever done in the commercial trade, hence do not trust your plantings to commercial seeds. Go to the man who is producing the best "grass" and have him save seed for you from choice crowns — those not producing too many stalks, but large ones.

Reject all plants that produce an abundance of seed because such plants may transmit that characteristic to their progeny. It is a well known fact that those plants that are heavy seed producers are equally light crop producers. Furthermore, not all the seed produced on a plant is equally good; that which is produced on the tips is usually small and of low vitality, and those that do grow produce weak plants.

All small and weak seeds should be rejected. This can be done by first floating off in water, at the time of saving the seeds, all that will float. The one who is saving the seeds must add water to separate the skins and pulp from the seeds after having crushed the berries. The berries should not be gathered until they have had some freezing; this softens them and makes the work much easier. Several washings will be needed to clean them perfectly. Let all seeds that do not sink readily run off with the water. When washed clean, spread out thinly to dry. When quite dry run through a windmill in which is placed the lower screen, with mesh just large enough to screen out all small seeds and allow the balance to pass over and out in the usual way. By turning the crank on the windmill at just the right speed any light seeds that escaped elimination by the water test can be blown out with the mild current. We then have the very best seed that can be procured without special breeding.

GROWING THE YOUNG PLANTS

The seed of the asparagus is very hard as well as very hardy. It requires a long time to germinate, hence should be planted as early as the soil can be worked and gotten into good condition. The plants can be grown on almost any kind of soil, but preferably not too heavy. Select a site near the buildings where poultry can run through it; they will keep the young plants free from the beetles.

After deciding where the seed bed is to be made the next requisite to success is the preparation, fertilization, and care of the young seedling plants. Remember first, that the asparagus plant is a very heavy feeder; second, that we are to grow a strong, vigorous root, as large as is commonly sold commercially at two years' of age, and do it in one season. In order to do that *feed* and *care* must not be neglected, therefore liberally apply yard or stable manure broadcast over the entire area where seeds are to be sown, before plowing. Plow and prepare as for other crops; mark off rows about 2 feet, 9 inches distant, opening each furrow with a plow; scatter in each row fertilizer analyzing about 4-8-10, at the rate of 800 pounds per acre. Mix this well with the loose soil and cover by throwing a furrow on it from each side, making a low ridge, and rake off flat. Sow seeds with a drill set to sow about three seeds to the inch, and also set to sow at a depth of one inch or a little more. If the soil is light one and one-half inches will be better.

The plants will be from three to four weeks coming through, according to the temperature and the time planted. From now on the main attention is cultivation, hoeing and additional fertilization. The young plants must be kept scrupulously clean and the soil around and about them mellow by frequent hand hoeings and horse cultivations.

Early in July an application at the rate of 200 pounds of nitrate of soda applied alongside the row and worked in, will be found valuable. This will stimulate the vegetable growth of the young plant but will be effective only about a month, so another application in August is desirable. The latter will last through the season. The object is to get as much growth as possible in one short growing season. If this work is carefully done and instructions carefully carried out, a better plant will be had at one year of age than is commonly grown in two years, and far better than any two-year-old plant.

PREPARATION OF THE PERMANENT BED

Since much depends on the appearance as well as size of the shoots much thought should be given to the soil where the bed is to be established. The soil should be more or less of a sandy nature, free from stones, fairly level, sloping toward the sun rather than from it, and the more depth of soil the better. On a soil that is thin and that is situated above a compact subsoil this crop will not do its best. The subsoil should be quite open — one easily penetrated by the roots.

The preparation of a plot or field for asparagus should begin the season before the plants are to be set. This can be done by growing thereon some hoed crop that requires liberal manuring and clean cultivation, allowing no weeds to go to seed. As soon as the crop is gathered, sow the land to some cover crop — crimson clover, if it will grow. If in a locality where none of the legumes can be grown, sow to oats or barley, but not rye, as the latter makes too much trouble in fitting the soil the following spring.

Sometime during the winter, prior to setting the plants, broadcast the area with yard or stable manure, using twelve to fifteen tons per acre. As early as possible plow as deep as soil will permit, turning everything under, harrow and mark off in rows five and one-half feet apart using a good two-horse turning plow, and then go each way in the same furrow making it as deep as the soil will permit, but do not go more than one inch into the subsoil. In the bottom of the furrow set the plants.

SETTING THE YOUNG BED

The young crowns should first be sorted and all small and weak speciments thrown out. Second, a sharp lookout should be kept for any individuals that have numerous eyes or bud fully developed, and they also should be cast out. A plant with that characteristic will always do the same, that is, produce numerous but small shoots.

Have a good lively boy to drop the plants and have him drop them on the inside edge of the plow furrow. Then let the setter grasp the plant by about one-half of the roots and place his thumb on the buds; straighten out the other half of the roots; place the plant on the solid bottom of the trench and cover with about two inches of soil; step forward with one foot on either side of the plant just set, which firms the soil. Place the next plant twenty inches distant and continue. Some growers plant as close in the row as fifteen or sixteen inches, while others claim two feet the proper distance. It resolves itself down to this: the narrow distance gives a crop earlier in the life of the bed but makes it shorter lived. The farther apart the plants are set the longer the life of the bed — all other things being equal. Some early hoed crop like peas, beans, carrots, etc., may be grown between the rows of asparagus the first season but not after. No manure should be used under the young plants because they live and start better on a solid bottom, and because it induces mice to harbor under it and destroy numerous plants.

CULTIVATION AND FERTILIZATION

About the time growth begins give a dressing of fertilizer down the trench over the young plants — any good potato formula will do. Use about the same per given length of row as for potatoes.

Cultivation must begin early, a small-toothed implement being used to fine the soil. Some soil should be allowed to run down beside the young plants, but not too much. The grower should be all season filling the trench.

Frequent cultivations and numerous hand hoeings will be required to keep the soil mellow and the weeds down, and this must be done or the whole thing spells failure. The future productiveness of any asparagus bed is largely governed by the way the young plants are grown and the way the permanent bed is cared for the first two years of its existence. If neglected, either in cultivation, hoeing, fertilization, or controlling of the insects, that neglect must be paid for in low yield and poor quality. A midsummer application of nitrate of soda of about 150 pounds per acre, applied beside the row and worked in, will be found beneficial.

During the fall of the first year apply a good dressing of animal manure. The best way to do this is to plow a furrow away from the plants on each side and put the manure therein and cover it by plowing back over it. This induces the root system to form down below and out of reach of the implements of cultivation.

All later manurings should be in an open furrow midway between each row and it covered. Once in two years will do for animal manurings where the soil is fairly productive, but an annual application of fertilizer applied at the first working of the land in the spring is essential. Be sure to apply this broadcast; not over the row as is sometimes done. By broadcasting it is better and more evenly distributed, hence where the plants can use it more readily.

At the close of the cutting season, when the bed is being leveled off, apply a dressing of nitrate of soda broadcast at the rate of 225 pounds per acre. This in my judgment is quite important. It is at this time that the plants need stimulating and the nitrate supplies it. I believe, too, it wards off the rust. Beds so treated are later in showing that disease.

Cultivation should be kept up sufficient to destroy all weeds and keep soil mellow.

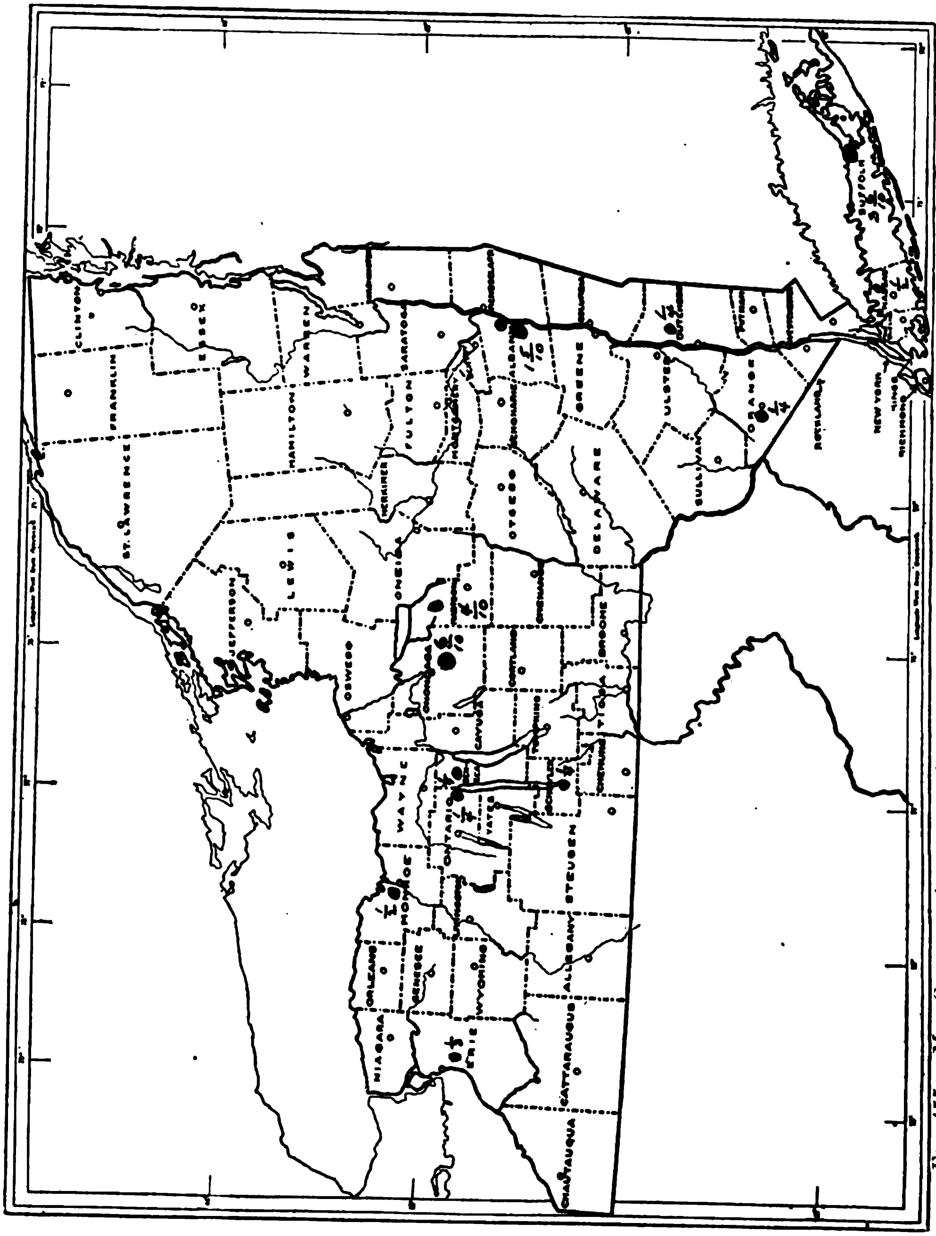


FIG. 455.—MAP SHOWING ASPARAGUS ACREAGE. FIGURES IN COUNTIES REPRESENT ACRES BY HUNDREDS

INSECTS

Nothing that I know of can be done for the beetle during the cutting season. All that can be done is to destroy the breeding stock the season before. This can be accomplished by spraying the foliage with arsenate of lead paste, 6 pounds to 50 gallons of water, with a heavy pressure. This may seem strong but less will not kill all old bugs. It is very important that the beetle and larvae be kept from young planted fields; they will soon damage it beyond recovery if left unmolested.

HARVESTING AND MARKETING

In this section white and half " green grass " is produced. The difference between the two is that one is cut as soon as it appears above ground, while the other is allowed to grow to five or six inches in height before cutting.

It will be readily seen that if white " grass " is to be cut there must be sufficient soil over the crowns to permit the knife to be thrust down deep enough to cut the shoot at marketable length, which is about nine inches. Hence we ridge, using an implement made for the purpose that piles the soil on top of the row and smoothes it off. For all green grass this need not be done.

Cutting is done every other morning until the weather becomes warm, when it may have to be cut daily. The " grass " as cut is taken to the packing shed and washed, when it is ready for the girls or women to bunch it. We make only two grades, primes and culls. The cut of the day is shipped in the late afternoon to the city, arriving there about midnight. Growers ship to New York City, Brooklyn and Newark depending on the market in each place. The "grass" is sold by commission men the following morning, the price ranging from $1.00 to $4.00 per dozen bunches according to supply and demand.

We read of wonderful yields so far as bunches are concerned, but 2,000 bunches of 3 pounds each or more is the exception not the rule. The yield is more frequently 1,500 bunches. The season of 1913 was very good, while that of 1914 was very poor, prices were low and the supply was greater than the demand. Thus it changes. While there is no bonanza in asparagus culture yet it pays those who know how to grow it.

ACREAGE AND VALUE OF ASPARAGUS GROWN IN NEW YORK STATE, BY COUNTIES

(Taken from U. S. Census, 1910)

County	*Acres*	*Value*
Albany	147	$18,114
Allegany	3	175
Bronx	....	....
Broome	6	2,032
Cattaraugus	....	....
Cayuga	7	1,300
Chautauqua	5	570
Chemung	8	1,396
Chenango	....	....
Clinton	....	....
Columbia	12	1,390
Cortland	1	98
Delaware	....	....
Dutchess	20	2,858
Erie	30	5,928
Essex	....	....
Franklin	....	....
Fulton	2	175
Genesee	1	100
Greene	2	40
Hamilton	....	....
Herkimer	3	515
Jefferson	5	505
Kings	....	....
Lewis	....	....
Livingston	13	1,312
Madison	38	3,335
Monroe	47	8,468
Montgomery	2	240
Nassau	47	6,358
New York	2	40
Niagara	3	1,050
Oneida	11	$2,823
Onondaga	58	8,357
Ontario	26	4,561
Orange	21	4,155
Orleans	2	166
Oswego	....	....
Otsego	1	100
Putnam	....	....
Queens	6	1,250
Rensselaer	5	590
Richmond	3	125
Rockland	1	210
St. Lawrence	....	....
Saratoga	5	1,400
Schenectady	14	2,736
Schoharie	....	....
Schuyler	21	1,080
Seneca	24	3,709
Steuben	....	....
Suffolk	358	33,784
Sullivan	....	....
Tioga	....	....
Tompkins	5	1,420
Ulster	14	1,622
Warren	....	....
Washington	1	56
Wayne	10	1,397
Westchester	8	1,220
Wyoming	1	90
Yates	4	520
The State	1,003	$127,370

MELONS

Chas. D. Barton, Marlton, Burlington County, N. J.

LOCATION

In the production of melons we are dealing with a group of plants that are almost semi-tropical in their natural habits, and in our temperate climates they thrive best in warmest weather. They will flourish in moderate droughts, but an excess of moisture retards growth, and cool nights are frequently a cause of failure. A full appreciation of these facts is the foundation on which a successful melon grower must depend for the solution of the problems that may confront him.

Earliness is an important factor, both from the standpoint of the financial return and the greater ease with which the fungous diseases can be controlled. Advantage should be taken of any aid which tends to advance the time of ripening.

The selection of the ground is of prime importance to this end. It must have good drainage, so that the excess moisture of a heavy rain can run off quickly. For the canteloupe a sandy loam gives best results, while the watermelon does best in the very sandy soils. A location sloping slightly to the south, or protected from cold north winds, has an additional value.

VARIETIES

The selection of varieties must be determined by the demands of the market to be supplied. In a general way markets are now demanding a medium-sized canteloupe, and the elongated shape, or Rocky Ford type, is the most popular. Some trade demands the pink, while others still prefer the green-fleshed varieties. The Sugar Sweet has with us proved a profitable green-fleshed variety, combining quality and earliness with good cropping; and in our experience is more blight-resistant than any pink-fleshed variety.

The Tom Watson watermelon has become very popular in the last few years. The quality is very good and it stands shipping well, but the vines seem rather weak and sometimes fail to mature the later settings of fruit. This fact may force us to return to the Dixie, although a little coarser in flesh and less regular in shape. Care in the selection of seed is of more importance than variety.

Seed selected from the best specimens of the home patch is superior to that secured by cutting the entire crop as the commercial seedsman must do.

PREPARATION OF SOIL

The preparation of the soil should be thorough, and an abundance of humus and plant food are essentials. Stable manure, broadcasted and plowed in, is valuable when available, but in our own practice we depend upon green manure for the humus, and chemicals for the additional plant food. The ground should be plowed early so that the vegetable matter is somewhat decomposed and thoroughly mixed with the soil. If sod land, fall plowing and early working in the spring will give a looser soil for planting. The better the preparation, the better and more easily will the cultivation of the small plants be accomplished.

Before the expected time of planting, 150 pounds of muriate of potash and 450 pounds of acid phosphate per acre are broadcasted and harrowed in. Two hundred and fifty pounds of tankage or other fertilizer containing 20 pounds of organic nitrogen in good form, is placed in drills running east and west across the field. Good ridges are thrown up and cross marked — four feet for canteloupes and ten feet for watermelons.

When the first runners are about twelve inches long, 100 pounds of nitrate of soda and 100 pounds of tankage are applied and worked in. The material must not be allowed to come in contact with the vines. This application furnishes an abundance of plant food at the time the fruit is making its most rapid growth, and adds to the quality of the product.

PLANTING

Melons may be started in plant boxes in cold frames and transplanted to the open ground when four or five rough leaves have been made.

The plants, however, are difficult to manage under glass and, for commercial purposes, the time gained in ripening does not warrant the expense of the operation. By the following method of planting we have succeeded in picking ripe fruit from seed planted in the open field almost as soon as from the transplanted plants, and at so much less expense that we have entirely abandoned the use of the cold frames.

Upon the approach of the first spell of warm weather after the tenth of April, we place half of the seed in a pan and cover it with water for twelve hours at a temperature of 90 degrees. The water is then drained off, the pan covered with a cloth and kept at the same temperature for another twelve hours. During this twenty-four hours we have furnished ideal conditions for the germination of the melon seed, and germination has advanced more than it would in a week in the ground at that time of year. We next mix the dry half of the seed with the soaked seed, and are ready to plant. With a cup of the mixed seed in one hand, and facing the south side of the row, we make a level opening with the toe of the shoe as far into the side of the row as we can without breaking the crest of the ridge; with the other hand, we drop from eight to twelve seeds in a line at right angles to the ridge. We then elevate the toe and cover, leaving the soil over the seed in about the same position as we found it. The following advantages have been gained by this method of planting, namely:

1. By sprouting the seed we secure an earlier stand than could be done by planting seed direct from the bag.

2. By mixing sprouted and dry seed we make two plantings at one operation. We have plants coming through at different times in case a late frost should injure the first ones, and the work of replanting is saved.

3. By covering with the elevated toe we produce a sloping surface over the seed which will not hold water. In case of heavy rains this protects against an excess of water over the seed, and prevents the formation of a hard crust for the delicate plants to break through.

4. By making the opening with the toe held level, and covering with the sloping surface, we have the seed at different depths. If

dry weather follows planting, the seed nearest the top will probably dry out and fail to come up. If heavy rains follow planting, the deep ones, near the center of the ridge, will probably never be able to push through the amount of soil over them. Between these extremes, there must be some seeds which are suited to the conditions of moisture which they encounter.

5. The sloping surface is in the position to absorb the greatest amount of heat possible from the slanting rays of the sun.

6. By planting on the south side of the ridge, the young plants are protected from cold winds by the crest of the ridge above them.

CULTIVATION

Cultivation is a great aid in maintaining the loose, porous soil conditions in which the melons thrives, and should be commenced as soon as the plants are well established.

If there is no inter-crop, the horse cultivator may be used in both directions, but hand hoeing must be depended upon near the small plants, and loose soil thoroughly worked up to them. The sooner the plants are thinned down to one in a hill, the easier the hoeing will be and the more evenly balanced plant we will have. Experience has taught us that we get more and better fruit from one plant in a hill than from any other number.

Cultivation should be continued frequently until the vines reach across the rows, being careful to select times when the soil is not very wet.

Care is necessary in handling the vines in the later cultivations. Twisting them is liable to break off the small roots, and it is difficult to return them to their original position. The vine that is turned squarely over falls back in position naturally and will seldom break if the dew is off before commencing work. Vines should be returned to natural positions as quickly as possible, and should never be left wrong side up over noontime or at night.

INSECTS

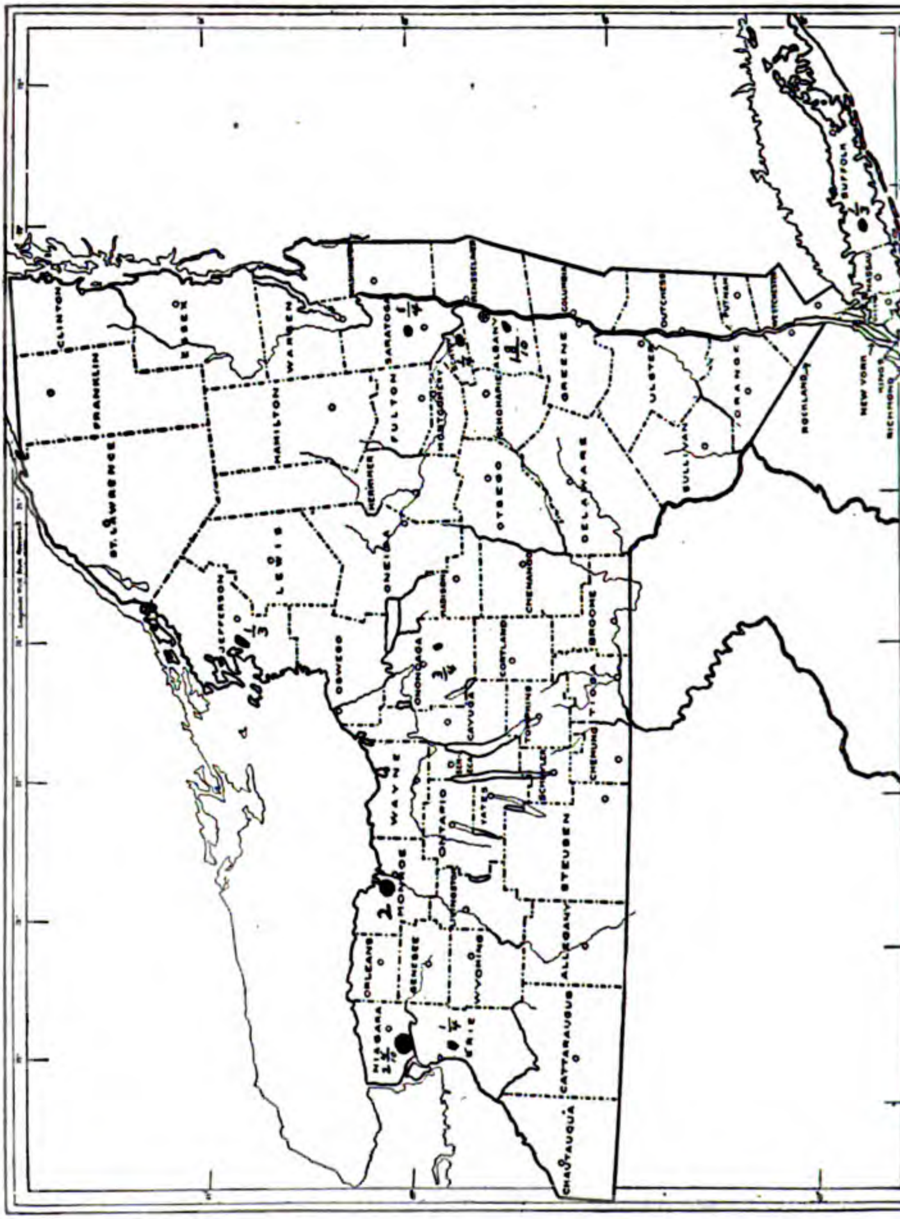
Cut worms, striped squash bugs and melon aphis are serious enemies. The regular cut worm mixture of paris green and bran, distributed over the ground before the plants appear, will prevent loss from cut worms. Offensive odors disturb the squash bug and any ill-smelling substance will rout him. Land plaster scented with kerosene is frequently used. Fish scrap or tankage, if prepared without the use of acid, are effective. Frequent hoeing and early thinning rob him of protection during the cool night. The melon aphis is only an occasional pest. When once established, its position on the under side of the vine and the consequent downward folding of the leaf, make it very difficult to fight. When the infestation becomes general throughout the field the task is hopeless. If, however, a few affected leaves showing in June can be washed with a contact insecticide, such as whale-oil soap, the infestation may be held in check until the multiplication of the lady bugs comes to our assistance. Cantaloupes are more frequently injured than watermelons.

FUNGOUS TROUBLES

The most serious problems of the melon grower in cool climates, particularly in the cantaloupe patch, are the leaf blight and anthacnose. Spots appear on the top of the leaves causing them to curl upward and die very quickly. Greatest damage is caused during cool nights followed by heavy fogs and sunny days. The very early plantings mature most of the crop before injury occurs. Many growers depend on early planting with good fertilization and cultivation to produce a good crop before the injury becomes severe. Others have found that a thorough coating of the leaves with bordeaux mixture at frequent intervals from the time of the appearance of the first rough leaves until maturity, has been effective. With the vines over the ground, however, this is a difficult and unsatisfactory operation, and the business of growing late plantings has been entirely destroyed in most sections on account of these diseases.

MARKETING

The cantaloupe is at its highest state of perfection when allowed to remain on the vine until the fruit freely parts from the stem and is then eaten within a few hours. Herein lies the problem of successful marketing. With a nearby market, the operation is simple. Careful picking every morning and prompt delivery gives the consumer the fruit in best condition. When,


CLINTON
ESSEX
FRANKLIN
ST. LAWRENCE
WARREN
HAMILTON
SARATOGA
FULTON
MONTGOMERY
RENSSELAER
ALBANY
SCHENECTADY
GREENE
COLUMBIA
DUTCHESS
ULSTER
PUTNAM
WESTCHESTER
ORANGE
ROCKLAND
SULLIVAN
DELAWARE
OTSEGO
SCHOHARIE
HERKIMER
LEWIS
ONEIDA
JEFFERSON
OSWEGO
MADISON
CHENANGO
ONONDAGA
CORTLAND
BROOME
CAYUGA
TOMPKINS
TIOGA
CHEMUNG
SCHUYLER
SENECA
WAYNE
ONTARIO
YATES
STEUBEN
MONROE
LIVINGSTON
ALLEGANY
ORLEANS
GENESEE
WYOMING
NIAGARA
ERIE
CATTARAUGUS
CHAUTAUQUA
SUFFOLK
NASSAU
NEW YORK
KINGS
RICHMOND
2
1/4
1/3
3/4
1/2

however, forty-eight hours or more must elapse before the fruit reaches the consumer, it takes careful picking and a trained eye to anticipate the ripening of the fruit, so as to get it to the consumer before deterioration has commenced on account of over ripeness, unless refrigeration is available. In picking for any market the cantaloupe which is overlooked and allowed to remain in the field one day too long is lost, or worse than lost if then put in the package. Disappointment in prices of sales is more often caused by including too ripe fruit than from any other one cause. One the other hand, the watermelon can be kept from a week to ten days after picking without undergoing deterioration, and so can be shipped long distances without refrigeration.

PROFITS

The melons are crops that are best suited to farms where extensive gardening operations are desired, rather than to those of small acreage where very intensive methods are practiced and large money returns are expected from each acre.

One thousand watermelons from an acre is a very good crop, and ten to twenty dollars per hundred is a good range of prices.

Cantaloupes seldom give more than five hundred five-eights-bushel baskets to the acre, and prices are liable to vary from thirty cents to one dollar per basket. These returns per acre would not be attractive to some market gardeners, but when we consider that fifty to seventy-five dollars per acre will cover the cost of producing and marketing these crops, the margin of profit is fair. Besides, other crops may be produced from the same ground at very little expense. Market peas planted early between the rows, grow well on the fertilizer applied for the melons, furnish a windbreak for the small melon plants, and the vines add humus and nitrogen to the soil at the time the melons most need it. A tomato plant placed between each hill ten days before the last cultivation has often materially increased the money return for us.

One strong point is the fact that crimson clover and hairy vetch sowed at the last cultivation always makes a good growth, and a melon crop in the rotation improves the fertility and humus content of the soil.

ACREAGE AND VALUE OF MELONS IN NEW YORK STATE, BY COUNTIES

(Taken from U. S. Census 1910)

County	*Acres*	*Value*	*County*	*Acres*	*Value*
Albany	179	$27,610	Oneida	2	$800
Allegany	....	....	Onondaga	76	9,078
Bronx	....	....	Ontario	8	950
Broome	9	400	Orange	10	1,603
Cattaraugus	2	250	Orleans	13	1,967
Cayuga	14	1,769	Oswego	5	825
Cattaraugus	2	350	Otsego	....	....
Chemung	1	300	Putnam	....	....
Chenango	....	....	Queens	....	....
Clinton	....	....	Rensselaer	13	1,363
Columbia	2	150	Richmond	....	....
Cortland	....	....	Rockland	2	40
Delaware	1	25	St. Lawrence	....	....
Dutchess	4	340	Saratoga	27	1,888
Erie	28	3,185	Schenectady	21	2,890
Essex	1	150	Schoharie	....	....
Franklin	2	300	Schuyler	....	....
Fulton	....	....	Seneca	7	1,000
Genesee	1	148	Steuben	....	....
Greene	5	850	Suffolk	31	3,299
Hamilton	....	....	Sullivan	....	....
Herkimer	....	....	Tioga	....	....
Jefferson	37	5,050	Tompkins	3	100
Kings	....	....	Ulster	9	425
Lewis	....	....	Warren	2	100
Livingston	12	1,557	Washington	....	....
Madison	....	....	Wayne	2	150
Monroe	196	24,890	Westchester	2	100
Montgomery	3	700	Wyoming	....	....
Nassau	....	....	Yates	5	300
New York	....	....			
Niagara	239	24,638	The State	978	$119,650

SQUASHES AND PUMPKINS*

SQUASHES

Types. There are two distinct types of squashes, summer and winter. The summer squashes are used in an immature stage, before the shell or seeds harden. In some varieties the flesh becomes coarse and bitter at maturity. The winter squashes are allowed to reach full maturity unless overtaken by frost, and under proper storage conditions may be kept until late in the winter. The summer varieties commonly grown are of bush form, while the winter varieties make long trailing vines. The summer varieties are less exacting as to soil and climate than the winter sorts and are the more reliable crop producers under unfavorable conditions. They will make a crop in the shade of a corn field and will also endure the intense heat of southern summers. Winter varieties, on the other hand, do not thrive in competition against corn, and suffer severely from extreme heat or drought. The summer varieties have hard, dense stems and vines, while those of the typical winter varieties are more fleshy and succulent. The summer varieties are small fruited and the winter varieties large fruited.

In addition to the two common types already mentioned, there are also two others that are grown to some extent. One is a small-fruited type resembling the summer varieties in size of fruit, texture of stem, and ability to withstand heat and drought. They are, for the most part, running rather than bush varieties. The fruit may be used at an immature stage, like summer squash, and they are also of good quality when mature. They may be kept for winter use the same as the large winter varieties. A typical representative of this class of squash is the Perfect Gem. Another type of squash grown to a limited extent in this country is the winter Crookneck or Cushaw. It forms long, often curved, fruits of large size, in which the seed cavity is confined to one end,

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*From J. W. Lloyd's *Productive Vegetable Growing;* J. B. Lippincott Co., Phila. Pa., publishers.

while the rest of the squash is a neck, three to five inches in diameter, which consists of solid flesh.

In England the vegetable marrow is used the same as summer squash is in America. It forms a running vine, and is handled the same as other squashes. It is grown to a very limited extent in this country.

Squashes in general are grown much less in America than their importance as a food would seem to warrant. Markets that handle hundreds of carloads of watermelons during a season are easily overstocked with a few carloads of winter squashes.

Culture. Squashes thrive best in soil containing considerable humus. Manure applied broadcast and also in the hill contributes greatly to the production of a good crop. The method of preparing a field for planting is much the same as for other vine crops. The entire area should be plowed and pulverized before the hills are made. For bush varieties the hills may be four by four feet; for running sorts they should be from eight by eight to ten by twelve, depending upon the vigor of the particular variety and the type of soil. Usually the seed is planted in the open ground, but occasionally the summer varieties are started in hotbeds and transplanted to secure an early crop. The same precautions must be taken as in transplanting muskmelons and cucumbers. Two or three plants should be allowed in each hill. The tillage and general care of the crop are the same as for the other vine crops. The running varieties make a rampant growth and no amount of training will keep them within prescribed limits. For this reason they should never be planted close to small vegetables that occupy the land late in the season.

PUMPKINS

Pumpkins are of three principal types: "mammoth," grown mainly for exhibition purposes; "field," grown especially for stock feeding; and "pie," produced principally for the making of pumpkin pies. Almost any variety of pumpkin may be used for making pies, but some sorts are especially adapted to this purpose. They are finer grained and sweeter than the other sorts. They may be stored for the winter supply of pies or the flesh may be canned for the making of pies at any time of the year.

Field pumpkins are often grown as an incidental crop in corn fields. They are like the summer squash in being able to endure the shade and also the competition against the corn. However, pumpkins are much more likely to produce large crops if they are relieved of such competition and given a piece of land to themselves. In this case they are planted and cared for much the same as winter squashes. However, on rich land it is not necessary to apply manure in the hills unless extra large specimens are desired.

10

PEAS

A. E. WILKINSON

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Peas have been known for centuries, being common among the early Greeks and Romans. At the present time they are widely distributed, being found as a native in Europe and probably in all parts of the United States. The crop is particularly popular in the northern sections of the United States, where it grows at its best. The requirements of this crop are, a cool temperature and abundant moisture. This undoubtedly accounts for its fine growth in the northern sections of the United States.

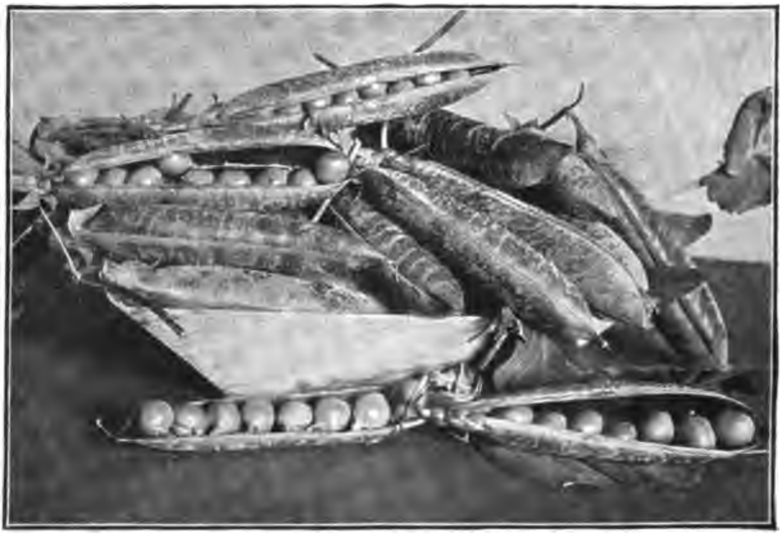


FIG. 457.—THE GRADUS OR PROSPERITY PEA. ONE OF THE EARLIEST LARGE-GROWING WRINKLED VARIETIES. PODS ARE VERY ABUNDANT AND WELL-FILLED

SOILS

Regarding the different soils for this crop, a non-acid clay soil or a silty loam seems to be best for the late varieties, whereas a sandy loam is seemingly best for all early varieties. On muck soils the pea crop may not be desirable, owing to the fact that it produces a rank vine growth and a limited pod formation. Contrasted with this are the light sandy soils which do not produce enough vine but do produce small pods in large quantities. A good example of adaptability of varieties may be shown by citing an instance. In southwestern New York State the cannery demands a late type of peas. Men growing peas on the hillsides on slit and clay loams were making from twenty to forty dollars per acre, whereas men growing the same variety of peas on river-washed gravel were actually losing ten dollars per acre. The latter soil was unfit for late pea production but would produce good crops of extra early peas.

ROTATION

As a rule, peas should be rotated each year. Where they are raised for canning, the peas should follow sweet corn or potatoes, or some other cultivated crop, because there will be a tendency toward a smaller production of weeds. It has always been noticed where wheat follows peas that the wheat crop is increased. In the garden, peas could be rotated with root crops or with other crops of a different nature. Combinations for rotation will easily suggest themselves to any thinking person.

FERTILIZERS

With peas, nitrogen and humus may be oversupplied, and it is necessary to be careful not to use large quantities of stable manure with this crop. Potash and phosphoric acid are never oversupplied. It has been found that wood ashes and well composted hen manure will give very good results. It is advisable not to mix these substances any length of time before applying. Better apply each separately. A good fertilizer for this crop is 350 to 500 pounds per acre of a fertilizer containing one per cent. nitrogen, six to eight per cent. phosphoric acid, and five to seven per cent. of potash. In some cases, 400 to 500 pounds of a mixture of potash and phosphoric acid, of which the percentages of the potash and phosphoric acid are equal, has given good results.

INOCULATION

Some attention is being given at present to the inoculation of peas. With intensive vegetable culture, inoculation may be of value. In certain locations where peas are not doing well it would be advisable to try inoculation on a limited area. It has been determined that inoculated seed is better than inoculated soil. The method of inoculating is the same as for clover, alfalfa and other legumes.

PLOWING AND FITTING

Where heavy lands are concerned, plowing in the fall seems to give the best results. With lighter soils, such as sandy and gravelly loam, spring plowing is undoubtedly preferable. In the spring of the year thorough harrowing, discing, and smoothing should be given. The preparation of the seed bed is very important and should receive the closest attention.

SEED

It is important that good seed should be obtained. Good seed can be produced in New York State. A person starting with certain varieties and practicing the method of selection could soon obtain a seed which is far superior to any that he could purchase. A test carried on by one experiment station is of interest. Where large seed was selected and planted, a yield of thirty bushels of grain and a ton and a half of straw was obtained. Small seed gave a yield of twenty-four bushels of grain and a ton and a tenth of straw. Split peas and others as they came from the thresher gave a yield of ten bushels to the acre. Weevil infested peas gave only thirty per cent. germination. In other words, of the three bushels of peas planted to the acre, practically only one bushel germinated, greatly reducing the yield. As a rule, seed produced in the northern sections of the United States and Canada is to be preferred to seed produced in the southern part of the country. Seed from certain reliable seed houses, where these firms have made a specialty of certain varieties, is to be preferred to the ordinary run.

PLANTING

The time to plant will vary somewhat according to the locality. One of the best rules to follow is, plant when the land is ready in the spring, which means generally April 20 to May 16. In the home garden and with many market gardeners, the planting should be arranged so there would be a succession.

AMOUNT OF SEED

The amount of seed to use varies with the soil, the variety, and the purpose in growing, the amount being from two to six bushels. For peas grown for the cannery, three bushels per acre seems to be a good average. In the home garden, where the rows are planted very close together, as high as six bushels would be used at certain times. The same may be true in the market gardens.

DEPTH OF PLANTING

Peas should be planted from one and a·half to two inches deep. If planted three, four, or more inches in depth, is it reasonable to expect the small seed to thrust the stalk and the leaves through this soil and make the proper growth? Sometimes nature will overcome such seeming carelessness in this regard, but if we wish to have the peas three or four inches deep in the home or market garden, why not cover them with an inch of soil, and after the seedlings have come above the ground, gradually draw the soil towards the plant.

MANNER OF PLANTING

Peas planted for canning are generally sown with the grain drill. The older practice seems to be to sow them but one way, across the field, using from two to three bushels to the acre. Modern practice is seemingly better, consisting of planting half the peas in one direction and the other half in the other direction, using at least four bushels to the acre. A larger yield of peas is obtained this way, as well as a more uniform stand. Sometimes canning peas are sown by hand and harrowed in. In some cases they have been plowed down. The harrowing and the plowing have decidedly objectionable features over the grain drilled peas, the peas not being covered evenly, an uneven stand, waste of seed, etc., but where a man does not own a grain drill, this method may be followed. In the market garden, and in the home garden, the one-row seeder, such as the Planet, Jr., Iron Age, Columbia, and

Genung may be used, the peas being planted at certain depths and certain distances being utilized between rows. Sometimes the gardener will plant the seed by hand, first opening the furrow with a hoe and dropping the seed in this furrow, covering and pressing the soil over the seed. This is a good method where the garden is small.

BROADCASTING

The principal objection to broadcasting is the fact that poor soil preparation and insufficient covering is generally given, resulting in smaller yields.

CULTIVATION

Where the pea crop is grown for canning, no cultivation is given. Therefore, the preparation of the land should be most thorough. In the market garden, cultivation should begin early and should be frequent; in fact, some men think it advisable to pass through the crop at least every five days. This would be a good practice for the home gardener. The pea crop requires about four hundred and seventy-seven pounds of water to produce one pound of dry matter. It is, therefore, very evident that cultivation is necessary to conserve moisture in the soil. Shallow culture is always advisable. The roots of the plant come so near the surface of the soil and spread so far that deep cultivation will be the cause of great injury.

Where tall sorts of peas are to be grown, some support is necessary. Such support may be given by the use of brush or chicken wire, or a trellis made with strings. For practical purposes, the chicken wire seems to be the best. Canning peas are not given support. The home or market garden may include tall sorts.

HARVESTING

As soon as the pods are ready and the inspector has given the word, the vines should be harvested. They may be cut with a scythe or a mowing machine. Where the latter is used, an ordinary hand rake may be used to collect these, and men with forks may follow and place them in a windrow. From this windrow they are placed in the wagon. The peas may be harvested with a swather, a tool particularly adapted for work on large areas.

This is a special machine having long-fingered guards to lift the vines. These guards are placed on the cutter bar of a specially constructed mowing machine. The knives of the machine cut the vines, which are rolled by specially constructed arms so that the pea vines will be left in a swath. Ten acres per day under favorable conditions can be harvested with machines of this type. Where an ordinary mowing machine is used, a side delivery rake is often employed, leaving the vines in a windrow. Immediately following this side delivery rake, hay loaders are used which place the vines upon wagons. Where a hay loader is not used, the pea vines are thrown in the wagon by hand, similarly to loading hay. The vines are then carried to the cannery or viner.

MARKET GARDEN

The peas are separated from the vine by hand and the pods collected in hampers or baskets. Some gardeners make but one picking, tearing up vines and all and separating the pods from the vines. The vines are dried and used for hay. Other men make two or three pickings, at each time removing only the largest pods.

The average price for picking a bushel of peas varies, according to the labor supply and the heaviness of the yield, from fifteen to twenty-five cents per bushel. It would be a good practice for the harvesters to grade the peas as they are picked at least into two grades, the first being the highest quality and others culls. The baskets containing the peas should be sealed at once and shipped immediately. Pre-cooling is desirable, because the crop heats easily. If this crop is slightly moist when harvested, cars will heat and often arrive at their destination in poor condition.

HOME GARDENING

The peas are harvested in the home garden by hand, the peas being carefully separated from the vine. Only peas of plumpness should be taken, thus assuring those fit to eat and of the highest yielding. Several pickings can be made from each variety, and, if a succession is planned, pods will be available over a long period.

YIELDS AND PRICES

From 1,500 to 2,500 pounds of shelled peas per acre are often obtained from canning peas. As much as two tons have been obtained under very favorable conditions. The market garden averages about 75 to 150 bushels per acre of unshelled peas according to the method of planting and the variety. In the home garden a row about 100 feet long would give three to five bushels of pods. Of course, this will vary with the variety and other conditions.

Canneries pay from two to two and one-half cents a pound for shelled peas. Lately there has been a system of paying introduced into some canneries where peas containing no hard or extremely large sorts bring as high as three cents a pound. The peas grade from this down to as low as one and one-half cents a pound, this price being paid for peas containing hard seeds and varying sizes. In the market garden three dollars or a little more per bushel is sometimes received, and the price soon drops to as low as fifty cents a bushel or less. The earlier and larger the pods, the higher the price.

COST OF PRODUCTION

As a general rule, the cost of producing an acre of canning peas varies from thirty to forty-five dollars. That includes all the work connected with the crop. In the market garden, the cost of this crop varies from forty to seventy-five dollars, according to the methods of planting and the yield. The profits from a canning crop are generally very limited. In many localities in New York State there is a dead loss instead of profit. If a man is able to obtain a profit of fifteen to twenty-five dollars per acre, he should be satisfied. In the market garden, from seventy-five to one hundred dollars profit is received at times. A man receiving fifty to seventy-five dollars for the crop and following on the same land with another vegetable in the same season should be satisfied.

INSECTS

Pea weevil.— The pea weevil is one of the most common insects. This is a beetle of brownish gray color having two black dots near the anal part of the body. Its head is bent under the body and ends in a sharp snout. The insect is quite common when the peas are in bloom. It deposits an egg on the young pod. The grub enters and eats its way into the interior of the pod, entering the pea. The insect remains within the seed throughout this larval stage and also through the pupal stage or rest stage, coming out in the early spring after the seed has been planted, as a beetle, to lay more eggs. The remedy in controlling this insect is to use bisulphide of carbon to fumigate the seeds. The way to do this is to place 100 pounds of seeds in a tight barrel or bin. Use one ounce of bisulphide of carbon, pouring the same over the seeds, and close the receptacle tightly. Allow this to remain for some time. The beetle will then be destroyed.

Pea Louse.— The annual loss from this insect runs into many millions of dollars. It is a small greenish-brown insect with long legs, found on the underside of the leaves. It is very tender and, therefore, should easily be controlled. On a small scale nicotine solution such as Black Leaf 40 should be sprayed on the plants, or a solution of kerosene, soap and water. Twenty-five per cent. kerosene should be used. Many birds and insects are its natural enemies. Another method is to cultivate the peas, sending a boy ahead to knock the pest from the vines, then bury these insects with the cultivator.

Blight or Leaf Spot.— This is a discolored area generally found upon the stem near the ground. It is somewhat similar to anthracnose on the bean. The disease works through the pod and to the seed, infecting it. The remedy is self-evident; select seed that is not infected. The vines may be sprayed with bordeaux, beginning when four to six inches in height and continuing about every four to six days. After the crop has been harvested, the vines should be burned, in order to check the spread of the disease.

Mildew.— Mildew is a whitish or grayish coating generally found on the pea leaves late in the season and after the weather has become somewhat warm. The remedy for this particular disease is dusting the affected plants with sulphur. Peas grown on cool sites are less likely to be troubled.

VARIETIES

For canning the Alaska is one of the common varieties. This may be a good source for the canner, but is a very poor eating

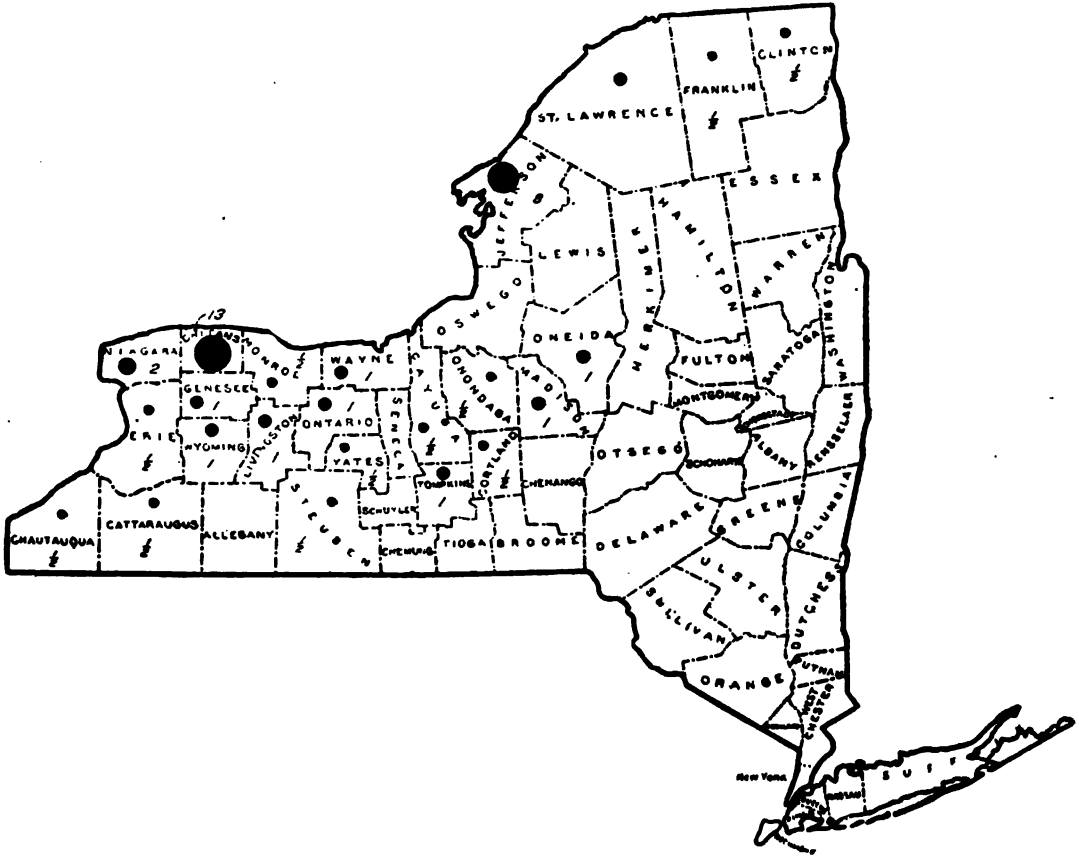


FIG. 458.—MAP SHOWING ACREAGE OF DRY PEAS. FIGURES IN COUNTIES REPRESENT ACRES IN HUNDREDS

pea. The Telephone is a very good variety, the Advancer, Admiral, Duke of Albany, Horsford's, Thomas Laxton, and others. It is a good plan for a cannery to try out different sorts each year, adopting the variety to meet the particular conditions.

For the market gardener, the Alaska, American Wonder, British Wonder, Excelsior, Early Surprise, Gradus, Market Garden, Thomas Laxton, Dwarf Telephone, and Duke of Albany are good sorts.

For a succession I recommend the Early Surprise for early, followed by the Excelsior (do not use the Notts), Thomas Laxton, Dwarf Telephone and Duke of Albany. For the home garden the varieties recommended under market gardening are very good. There are many other sorts which may be valuable, and it is recommended that they be tested out by the individuals.

BEANS

H. E. Cox, Geneseo, N. Y.

I have stated on previous occasions, when this subject has been given me to discuss, that, although I was raised and have always lived in the bean belt and have all my life raised more or less beans, still I can truthfully say that, " I do not know beans." And I think this is true, also, of bean growers generally.

In all our farming operations there is an element of chance, because of conditions over which we have no control. Bean growing is a gamble, but if we have land suitable for growing beans it is " good business " to take the gamble.

In beans we have one of the most nutritious and highly concentrated food products offered by the vegetable kingdom. Their value when cooked as a means of supplying protein in cattle rations is justly recognized, but their value as human food is too great to allow of economical stock feeding excepting where, from weather damage at harvest time or other cause, they have become unfit for food simply by their appearance. Even these beans, when boiled in an arch kettle for the cows and pigs, appear appetizing enough so that a real hungry man would not be injured either mentally or physically by making a meal from that same stew. They were used last winter on our Orchard Ridge Farm, cooked and fed with the ensilage, with excellent results.

A SECTIONAL CROP

Wheat, potatoes, hay, corn and alfalfa are grown quite generally over the whole country. It is interesting to notice how readily conditions can be changed to suit the requirements of alfalfa. On the other hand, cotton, tobacco, sweet potatoes, beans, etc., are sectional crops; that is, they flourish to greatest perfection under certain soil and climatic conditions supplied only by particular sections of the country.

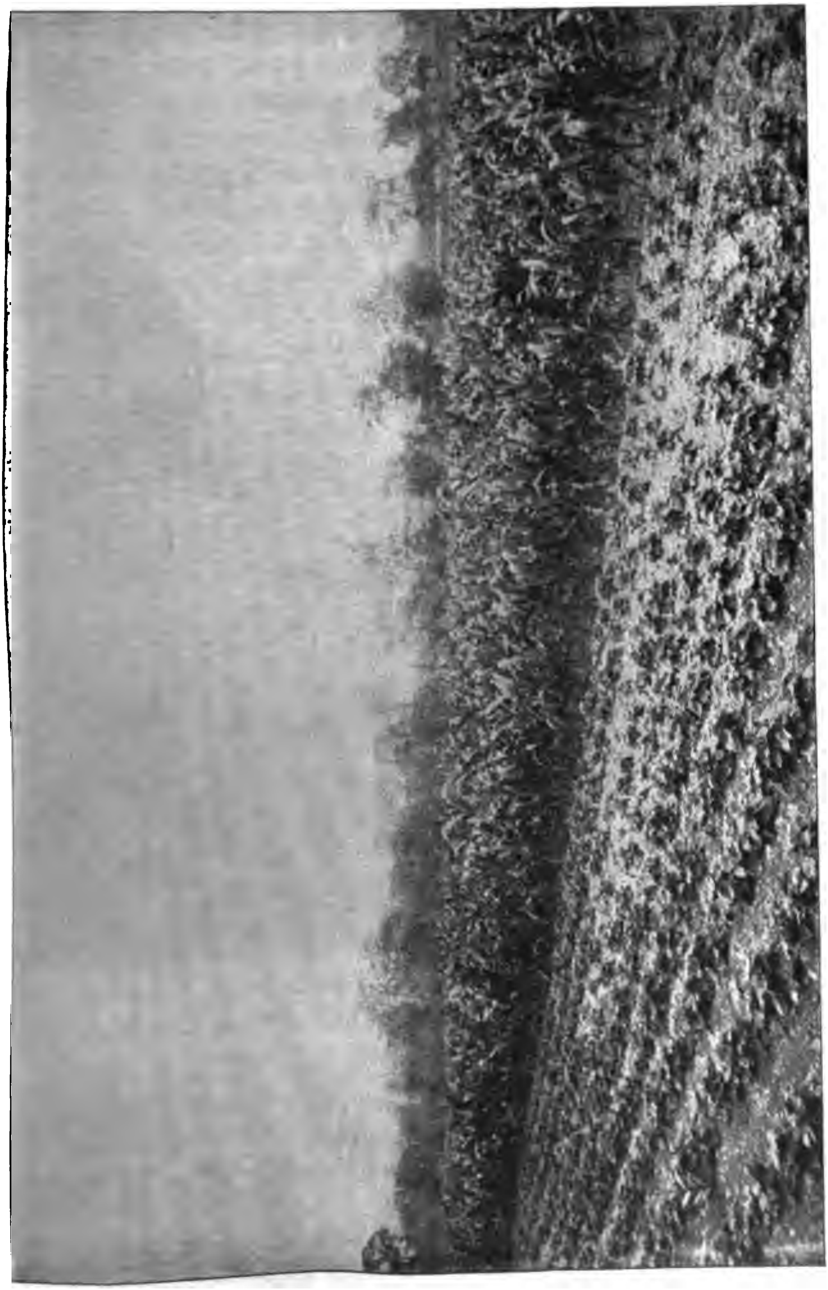


FIG. 459.—BEANS AND CORN IN AUGUST ON FORMERLY UNPRODUCTIVE, UNDRAINED LAND

HISTORY

Not much attention was given to this now great feature in our crop rotation until about the time of our Civil War. Then the demand caused them to be tried quite generally as a field crop in rotation with other crops. It was soon learned by experience that certain counties in this state were naturally adapted to their growth and profitable development, and to this day these localities in this and other states are recognized as bean growing districts. At the present time, the demand for this farm product is so great that they are an unusually profitable crop and efforts to extend their territorial confines are being made with varying degrees of success. I know of many sections in our state where heavy crops of corn and other products are grown annually and where beans will not produce a profitable crop. The vines may be in evidence in great profusion but the beans are not there.

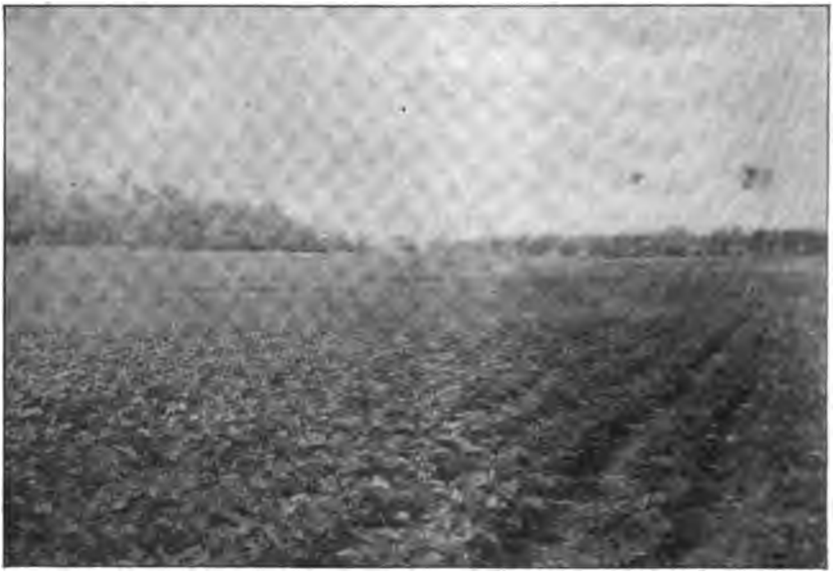


FIG. 460.—A FIELD OF MARROW BEANS NEAR MATURITY, ON MARLBOROUGH FARMS. YIELD, 30 BUSHELS PER ACRE

COMPARISON WITH OTHER CROPS GROWN

In many sections, especially in Monroe and Livingston counties in New York State, where I am better acquainted with actual conditions, the yields per acre of wheat and other farm crops have been on the increase, while in these same localities the yield of beans has grown less and more uncertain, excepting under unusual seasonal conditions. A number of years ago I planted thirty acres of beans one year. Some of this land was sod, but most of it had grown beans, corn or potatoes the previous year. The season was ideal, and an average of thirty bushels to the acre was the result. I began to think that I " knew beans." The next year I planted about the same acreage. The season was just the reverse of the preceding one and about twelve bushels to the acre was the result, and these not first quality.

PREPARATION OF LAND FOR BEANS

This should not be left until the year we wish to plant the crop, for the first preparation is a good sod — a clover sod is preferable.

As to time of plowing the land: if the soil be of the heavy order, late fall or early spring is the best time, although good crops are often grown when the plowing has been delayed until quite late in the spring — but this is an exception to the general rule. Lighter soils should be plowed in time to give the land thorough preparation. If a heavy application of manure has been given the sod direct, it is better to grow a crop of corn the first year and follow with beans, then wheat, and seed again, making a four-year rotation. There is no better implement for levelling and firming the ground than the plank drag or old-fashioned clod brusher. This implement removes any humps in the furrows and deposits them in the spaces between, as well as filling up the deep holes made by the horses' feet, and these holes and depressions mean a big item, taking the whole field into consideration. If they are left as the roller leaves them, they must be filled by the harrow with loose dust, and an even, firm undersurface is not possible. Beans need this in order to get an even start — a very important first step. A roller presses heavily on the highest spots and does nothing at all to the little hollows and holes. Up to this point, if the furrows have been leveled and firmed the same day they are turned over so as to better conserve the moisture, with the soil in good heart and the harrow used often up to the time of planting, we have so far done our part toward giving the crop a good start.

WHAT KIND OF BEANS TO PLANT

This question must be settled definitely by the rule of cut and try, although there are some general rules. Without question the variety known as pea are best adapted to the lighter loams and sharp gravelly soils. Beans of any variety do not produce well on leachy soils or soils over-saturated with water. The varieties of red beans are best adapted to heavier and darker soils as are also the white marrows. This latter variety is produced profitably on a much smaller area in the bean belt than are the other sorts. There is a section in Livingston county where these are raised more than any other kind.

SEED BEANS

A great deal depends on the selection of the seed. If there is a crop that one has seen growing and knows about, that has escaped the diseases so often affecting it, it will pay in dollars to secure such seed at any price within reason. There are sections where, for different reasons, the crop is practically healthy and from which seed can be procured through reliable parties. Produce firms dealing largely in this crop often have shipped in a carload or two of such seed for the use of the growers whose crops they handle, and I have seen the yield doubled by such change of seed. I have had personal experience to verify this fact.

QUANTITY OF SEED

There is a wide difference in the quantity of seed used to the acre. Many believe that thick seeding increases the yield. I firmly believe that, if the land is in proper heart and adapted to bean growing, as much in quantity and of better quality can be grown if the plants are not crowded in the row. The rows are usually 28 inches apart. In my own opinion sixteen or eighteen quarts of pea beans and thirty-two to thirty-four quarts of the large beans, according to variety, are sufficient where conditions are right. We have noticed that when a bean plant grows alone, the pods are more numerous and the individual beans are of larger size.

FERTILIZING

There can be no general rule as to the make-up of a fertilizer for beans. All soils differ in their requirements. Even differ-

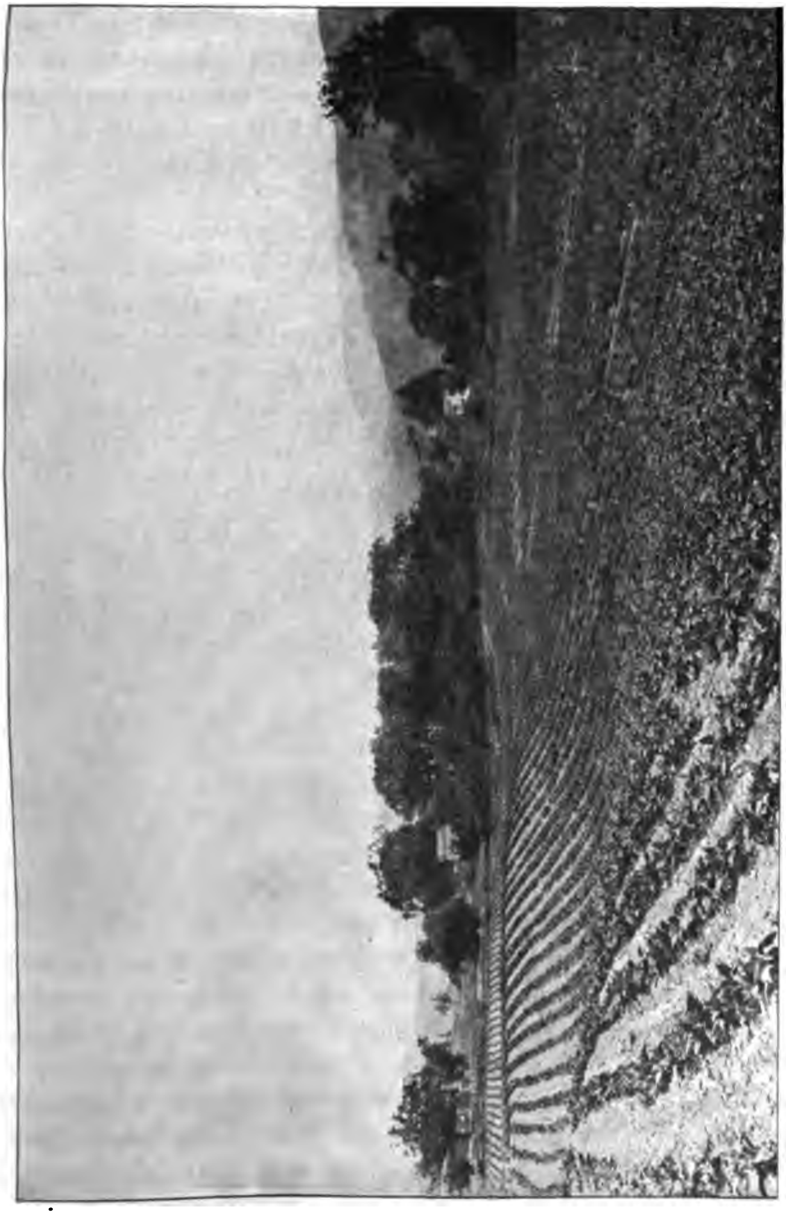


Fig. 461.—Field of Red Kidney Beans on Farm of R. C. Brown, Hoosick, Rensselaer County, Showing the Possibilities of This Crop in Eastern New York

ent fields on the same farm need different fertilizers. The first essential is to have a good sod as a foundation; then vary the analysis according to how the land has been treated previous to the sod condition, and, if a fertilizer is deemed necessary, let the percentage of phosphoric acid predominate. Still, many advocate high-grade goods and use them, such as 4-8-10 and 4-10-4. Theoretically, this formula should give results; practically, the expected results do not always materialize.

I recall two fields of white marrow beans growing on opposite sides of a highway this past season. They were both given about the same start as to soil and preparation. On one field a 10-8 fertilizer was used and on the other barnyard manure was spread during the fall and winter and no fertilizer used. The first field ripened early and yielded about ten bushels to the acre. The second field was about a week later in ripening and yielded twenty-three bushels to the acre. This field was planted the twelfth of June.

I have talked with a great many bean growers and have asked them this question: "When you left strips across your fields where the fertilizer was not used, did you notice any difference in appearance or yield between these rows and those where you used the fertilizer?" The answer has invariably been, "No, but I have seen the crop injured in dry seasons by fertilizers." Then I ask: "Have you been using it in this way on wheat?" The answer is, "Oh, yes, and could see good results even on the grass that follows the wheat." This confirms my own experience, and right there is the place to use the fertilizer; we always get results from its use. But for beans, the place to use it is on the sod previously, not directly on the bean crop. Let the nitrogen or ammonia get toned down by the grass crop. Then the three ingredients of a complete fertilizer will be present — nitrogen, phosphoric acid and potash. Enough of the latter will be rendered available for the requirements of the growing crop.

If a fertilizer is used let it be drilled over the whole surface of the field previous to planting the crop. It is the general experience with us, in this section of the bean belt, that land that has always been wet and unproductive will, after drainage, produce heavy yields of beans. Usually a crop of corn is raised the first year on such lands, for this has always been the great pioneer crop. It seems to whip the soil into its normal condition. I have one field in mind where conditions had long been considered hopeless. The first year after drainage, the crop planted was very poor. It was then given an application of barnyard manure. This treatment acted as a tonic on the soil, and good beans as well as other crops have been the record on that field ever since.

PLANTING AND CULTIVATION

When soil and season conditions are normal, from the tenth to the twenty-fifth of June is the usual time for planting. If, for any cause, the crop is planted unusually late, either the pea or yellow eye varieties should be used, as these varieties require a shorter season for growth and ripening. When conditions are right the rows of beans usually show up in four or five days, if not planted too deep — not over one and one-half to two inches. I have cultivated field beans six days after planting, but this was a little out of the ordinary.

FIG. 462.— BEANS ON THE FARM OF M. C. BURRITT, HILTON, MONROE COUNTY, N. Y.

No crop that we grow responds more readily to cultivation than does the bean crop. If other work presses, it will pay to hire extra help to keep the cultivators moving from the time the rows can be nicely seen until they are well in blossom, and sometimes when the pods are forming. Why? First, because by the use of shields, the first time over one can run quite close to the row and not injure the roots of the plants, and, for the same reason, he can go deeper. Again, it stirs up and covers up the little weeds which at that stage in their growth are easily destroyed. Cultivation prevents a crust forming, lets the air into the soil, and attracts and conserves moisture. At the second cultivation, the teeth or steels next to the row should be set more shallow, and after that the cultivation should all be shallow. Often a crop of beans is badly injured by deep cultivation thoughtlessly done, for the fine feeding roots extend across the whole intervening strip, occupying the entire soil. Cultivation should never take place when the vines are wet, because in that condition the disease spores are scattered if they are present, causing great damage.

HARVESTING

It is a good plan to let the crop get quite well and evenly ripened before cutting. Ordinarily there is not much danger by shelling. The cutter turns two rows together. A side delivery rake is often used to roll four of these rows together, two going across the field and two coming back. In this way we have eight single rows in one. After lying in the windrow a few hours they can be cocked up as hay, keeping the bottoms of the cocks well tucked under so as not to have so much base. Thus they will be safer from weather damage, will cure faster and better, and can be pitched on the wagon and hauled out of the field in half the time. The bunches are usually turned over a few hours before hauling to give the bottoms a sunbath. In any event the crop must be dry and hard before being put into the barn or stack, or damp beans will result, and it is a very difficult task to dry them after threshing. There should be one ironclad rule in harvesting — never leave a load of beans in the field one minute after they are ready for housing, for no crop is more damaged by bad weather than is the bean crop, and with no other product is greater loss entailed. It is a discouraging job to turn and re-turn beans in the field, being all the time conscious that this loss and worry could have been avoided by a little care in management.

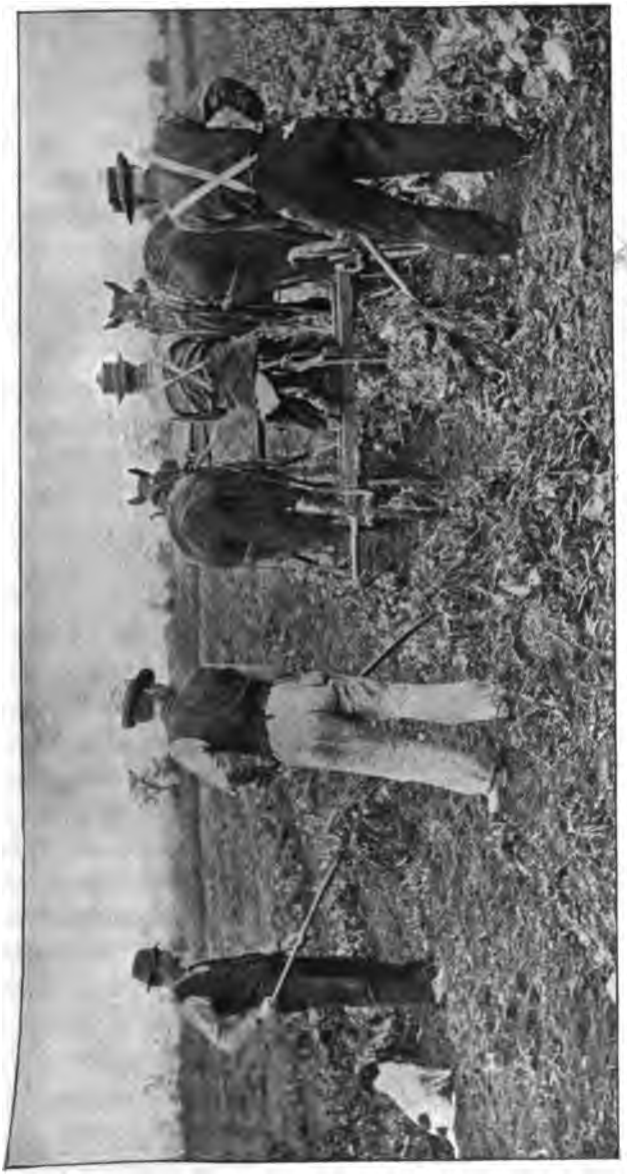


FIG. 463.—BEAN HARVESTING ON THE FARM OF M. C. BURRITT, HILTON, MONROE COUNTY, N. Y.

THRESHING AND MARKETING

On large farms, where there is plenty of help of both men and teams, threshing from the field is sometimes practiced, but this is not general or to be recommended for we are never sure what kind of weather tomorrow may have in store for us, and beans must be threshed when dry. Very little splitting of the bean occurs where the modern double cylinder bean thresher is used. In new localities where there are not enough raised to afford such a machine they can be trodden out with horses smooth shod or bare hoofed. I have assisted in threshing many hundreds of bushels in this way during the earlier stages of bean growing in Monroe county.

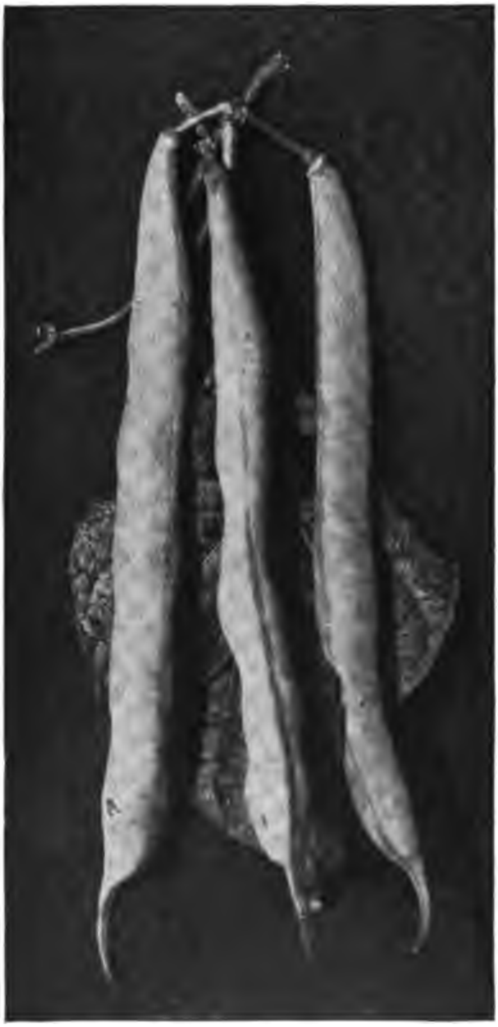


FIG. 464.— WELL-FILLED BEAN PODS

When we as farmers get a crop of any kind ready for market I believe that, covering a term of years, we are money ahead by selling just as soon as the market is right. It is much safer to hold on, if we must, when the price is low, but it is not good business, all things considered, to hold because prices are booming.

YIELD OF BEANS

The yield of beans varies from five to thirty-five bushels to the acre, according to adaptability of soil, variety of beans and seasonal conditions. In the older bean growing sections both the acreage and yield per acre is much less than formerly. Last year in our best bean section there were more ten-bushel yields than twenty. Here again we " don't know beans," for on these same fields and farms wheat and other crops yield as good, and in many instances better than formerly. Hundreds of acres of bottom land in the Genesee Valley that in former years could be counted on for big yields are now given over to grass and cattle, for beans are not profitable any more on these lands. New territory for growing this crop is being tried out with more or less success. This one thing is certain: any farm product that brings in such good money in so short a time will eventually cause the removal or correction, to a great degree, of adverse conditions and influences that now handicap its progress.

DISEASES OF BEANS

The principal diseases affecting beans in field culture are anthracnose or pod spot, rust and blight, the first being the most destructive. These are fungous diseases and as yet the station experiments have not shown that any treatment of plant or seed will prove of practical usefulness in controlling the trouble. The seed from a pod that is free from disease, planted on ground that is not infected with the spores of disease left over from previous crops, will produce crops free from disease. Blight and rust we have long had to contend with. These are mostly confined to the foliage and are more disastrous to the crop in hot, moist seasons. No treatment of the seed has yet proved of any value in controlling these diseases. Pod selection is the only preventive.

AFTER CROP CONDITION OF THE SOIL

As we have referred to soil preparation and conditions preceding the bean crop, we will now consider the aftermath. If the crop has been properly cultivated, what few weeds escaped destruction have been cut out by the bean harvester, and the land is in the best possible condition for wheat seeding after being gone over a few times with a spring-touch harrow. This gives a better preparation all through than was afforded by the summer fallow practice which was the usual method of preparing land for wheat before the advent of beans as a field crop. With a well tended bean crop we are summer fallowing and at the same time growing a cover crop that pays all the expense and usually much more. The benefit in either case is from the shade and thorough tillage given the land which brings the humus in the soil to a condition avoilable to plant growth, and beans being of the trifolium order of plants, or a nitrogen gatherer, the soil is left in better condition as regards this element. Now with wheat and seeding, after a bean crop, the sod begins again to furnish new material for humus, and will be ready for the bean crop in rotation.

SUMMARY

Profitable bean growing depends upon the following:

1. The adaptability of the soil conditions, or the possibility of correcting adverse conditions.

2. The previous management of the field, and a thorough preparation of the soil.

3. If a fertilizer is used, let it be after a careful study of conditions. Use it on the wheat preceding so as to insure a good sod. In this way thousands of dollars could be saved bean growers.

4. Cultivate thoroughly, but after careful study of the plant's requirements.

5. Plant in rotation on sod, or after corn that was grown on sod.

6. Harvest when fully ripe and house when dry enough to admit of storing.

7. Do not become a speculator unless you can afford to. There is a positive loss in shrinkage, and often unheralded changes in market conditions.

GARDEN BEANS

A friend of mine who is at the head of a large seed house tells me that there are about seventy-five varieties of garden beans that are worthy of selecting from, having all combinations of colors from pure white to ebony black, and many of them beautifully spotted.

As with the field sorts, some kinds are better adapted to certain soil conditions than others. The yellow pod varieties are popular in the north, while in the south the green pods are more in demand. Perhaps they are better adapted to conditions there. The Early Valentine is a green pod sort and a good yielder. The Golden Wax or butter bean is a general favorite for the home garden. The pods are yellow, well filled and are a stringless snap. The dried bean is about the size of a field medium, with a white back, while the eye side of the bean is a speckled purple and white.

FIG. 465.—A FIELD OF BEANS CURING IN THE COCK. THE WASTE LAND HAS SINCE BEEN DRAINED AND THE WATER PIPED TO FARM BUILDINGS. THAT PART OF THE FIELD NOW RAISES THE HEAVIEST BEAN CROP

Then there is another bean that was kept in stock at our local stores last season and was quite generally planted. It is called the Hodson Wax Pod, a speckled red and white bean about five-eighths of an inch in length. It is a later bean than the Golden Wax or butter bean and has proved to be a very strong grower and a heavy yielder. I had four varieties in my garden the past season (1914) and this was one of the best of the four. If they would yield in the field as they did in a neighbor's garden they ought to reach twenty bushels to the acre. I am told this sort is grown to quite an extent by market gardeners, as the pods, being nearly six inches long, measure up well for the market.

Among the other excellent garden beans are Round Pod Kidney Wax, Davis Wax and Flagalett Wax. The pods of this sort are long and quite large. The dried beans are a dark blue black and longer than the butter bean. These yellow pod beans that I have grown in my garden have given satisfaction, and there is very seldom any sign of disease. The old and well-known Cranberry, a large, round, red and white speckled bean, needs no description here. It is not as popular at present as some of the newer sorts. I have raised the Black Wax, Refugee and Valentine as a field crop, on contract for a seed house, but the yield was too light for a continuation of this practice. I am told that the yield of field grown garden beans is decreasing and that five or six bushels is about the average. The price has been around $4.00 a bushel, but as the 1914 crop was short it looks as if we would receive $10.00 a bushel for seed garden beans grown on contract.

LIMA BEANS

Perhaps the best early bush lima is the Fordhook. This variety followed by Wood's New Prolific will give a prolonged season for this delicious garden bean. Bush limas are in every way as good as the pole varieties, and for that reason are rapidly superseding them.

CONCLUSION

Where conditions will allow of profitable bean growing, this is a very desirable crop to raise; first, because of a quick money return, and, second, because the crop, if properly cultivated, will leave the ground in fine condition for wheat and seeding to grow, and the bean haulm makes a valuable addition to the coarse fodder for stock in winter, even for milch cows, if fed once a day.

Then, again, a farm without a garden is sadly incomplete; and a garden without a succession of vegetables, especially beans, is surely unbalanced. Always having been used to a good garden, I cannot picture a real country home without this economic and educational department.

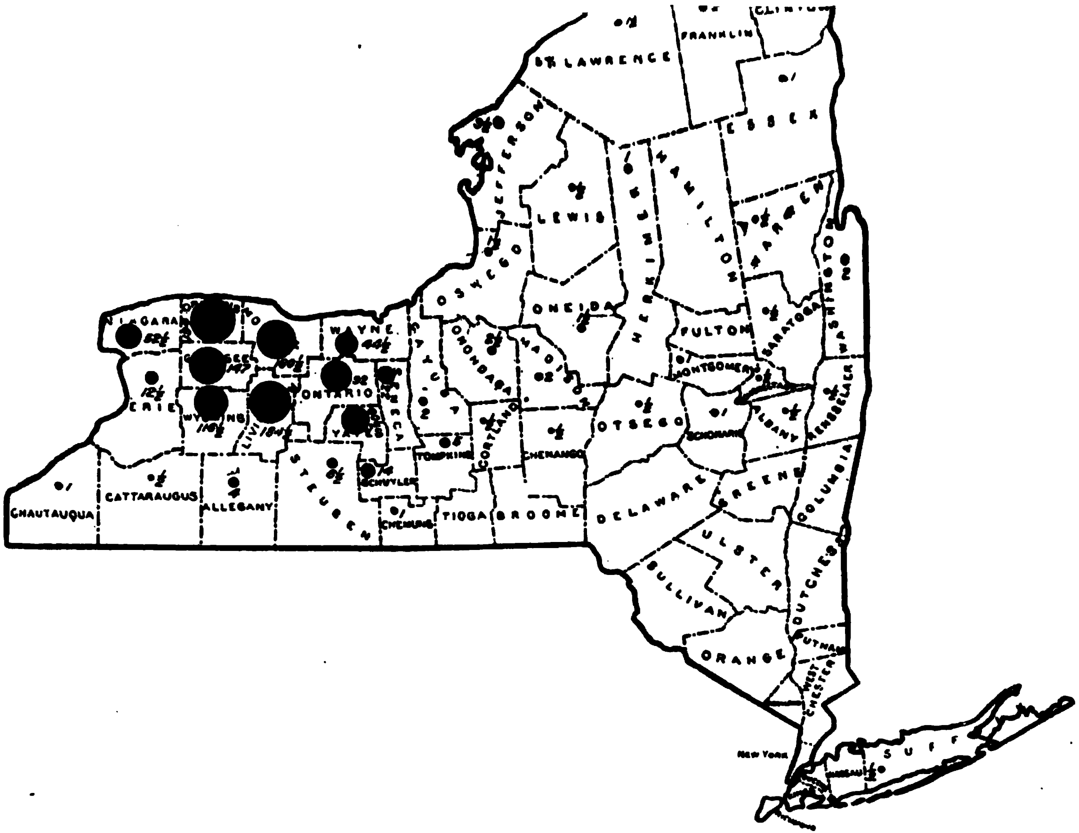


FIG. 466.—MAP SHOWING BEAN (DRY EDIBLE) ACREAGE. FIGURES IN COUNTIES REPRESENT ACRES IN HUNDREDS

LETTUCE

W. L. Bonney, Batavia, N. Y.

MAGNITUDE OF THE INDUSTRY

It is within comparatively recent years that the growing of lettuce commercially — that is, in car lots — has become a business proposition among the market gardeners of the state.

There is probably no other vegetable the production of which has increased so rapidly as that of lettuce. There are two reasons for the wonderful growth of this industry. One is a growing demand for this healthful and delicious vegetable, and the other, the rapidly increasing development of the muck lands of our country, in which soil lettuce seems to reach perfection.

The acreage planted to lettuce in this state is very large and is increasing each year. It now takes in South Lima, Livingston county; Arkport, Steuben county; Sanborn and Middleport, Niagara county; Williamson, Wayne county; Fancher and Holley, Orleans county; Fulton, Oswego county; and the muck lands near Syracuse, Onondaga county; Canastota, Madison county, and Chester, Orange county. In fact in every section where muck lands are being developed a large portion goes into lettuce.

VARIETY AND SEED SOWING

There are a great many varieties of lettuce, but we feel safe in saying that 90 per cent. of all outdoor lettuce (of which this article is treating), is the Big Boston.

The seed of this variety may be sown as early in the spring as the ground can be fitted for the purpose. The ground should be prepared as follows: after plowing the land in the spring, sow broadcast a high-grade fertilizer and work well into the soil. Sow the seed with a garden seeder in rows fourteen inches

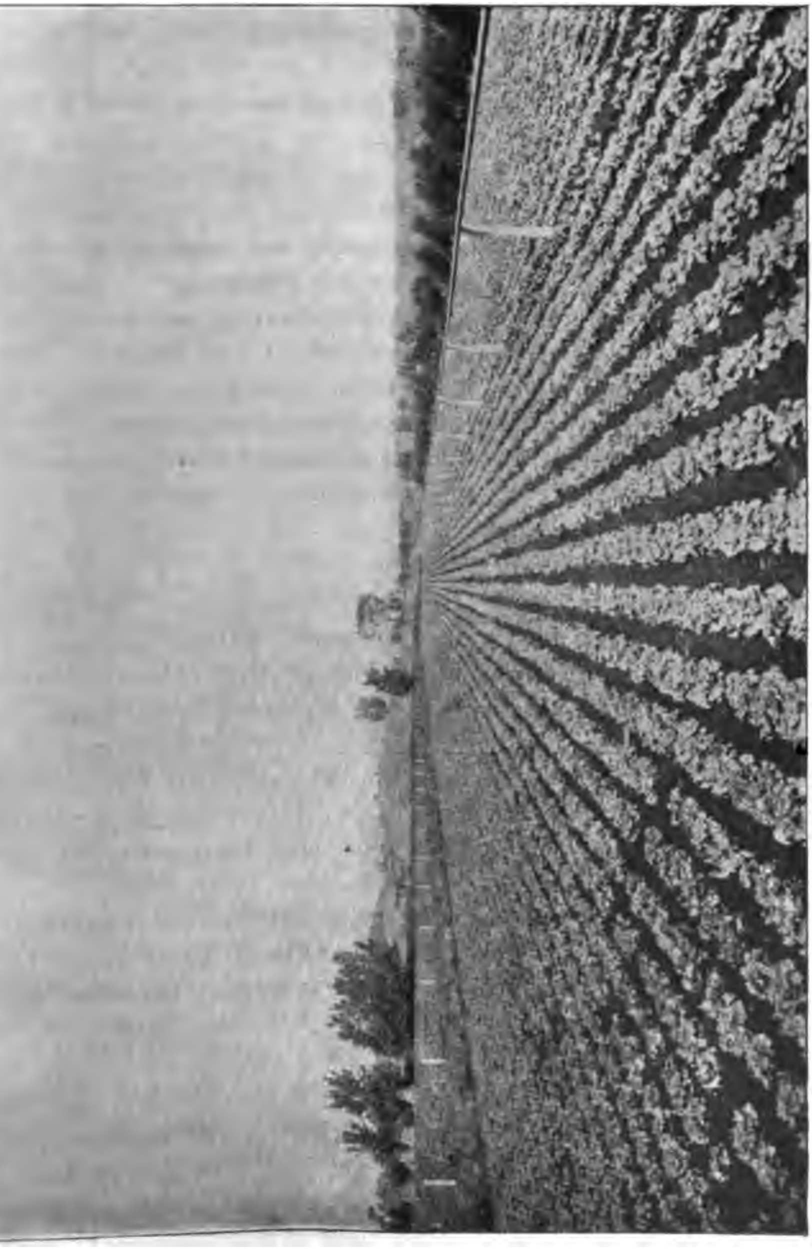


FIG. 467.—LETTUCE GROWN ON MUCK LAND

apart, at the rate of from one to two pounds per acre, depending upon the amount of moisture in the soil. Should the soil be very dry the seed may be soaked until sprouts appear, then dried quickly and sown. When plants have their second leaf, thin to twelve inches in the row. These sowings may be continued a few days apart throughout the entire season.

CULTIVATION

Start cultivation as soon as the rows can be seen distinctly, using some of the many wheel hoes for this purpose. Continue these cultivations as long as possible without injury to the plants. No one tool will do satisfactory work under all conditions. We use various types of wheel-hoes as well as hand-hoes, since conditions may vary. We also hand weed whenever necessary.

Lettuce is a very rapid grower, and is usually well headed in seven or eight weeks from time of sowing, except late in the fall.

CUTTING AND PACKING

The common butcher knife is used for cutting and removing all soiled and diseased leaves from the heads, which are placed in a hamper. These hampers are carried to the lettuce bench where the heads are sorted and packed in boxes and hampers according to grade.

The box used is 16 inches wide, 23 inches long and 8½ inches deep. This holds two dozen heads of No. 1 lettuce and thirty heads of No. 2. The No. 3, or third grade, may be packed in the regular half-barrel hamper.

To obtain the best results in getting the lettuce to market in a crisp, firm condition, it should not be packed in the hot sun. On hot, sunny days, cut early in morning and late in afternoon and take to the packing shed to sort and pack.

SHIPPING

Before loading, cars should be cooled by having ice boxes filled twenty-four hours before the lettuce is put in. Place five boxes in a row across the car, dividing the space, which leaves three or four inches between the boxes. Pack these boxes five high with one-inch strips between each row. A car will accommodate about four hundred boxes. The hampers may be placed on top of the boxes in the ends of the car, near the ice chests. See that the latter are filled before starting and keep well iced in transit.

MARKETING

The marketing of this as well as other perishable crops is a large factor governing either the success or failure of the proposition.

There are two ways in which the marketing may be done: contracting the entire crop at the beginning of the season, or shipping on commission. Occasionally a buyer will purchase a crop in the field when it is ready to be moved. Which of these methods is the best is a question which every grower must decide for himself. If he can contract at a fair price to a thoroughly reliable party, he is sure of a market for his product; but if the "high spots" in the market outnumber the "low" ones he will do better to sell on the open market.

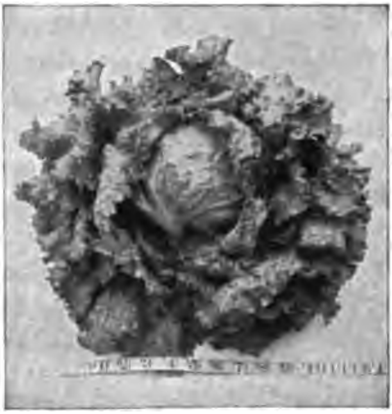


FIG. 468.—A WELL-DEVELOPED HEAD OF HANSON LETTUCE. THE PLANT IS OVER A FOOT ACROSS

A WORD OF WARNING

To those who have never played "the lettuce game" but are contemplating doing so, we would like to make a few suggestions: Fertilize and prepare the ground carefully; spare no time or expense in caring for and working the crops thoroughly; have in readiness all the necessary packages and equipment for shipping a maximum crop. While doing this, cultivate that sweet, sunny disposition which will enable you to smile as you quietly tell your man, "Plow under the whole crop," when you notice some morning that it has "all gone wrong." Or, if you are fortunate enough to escape all the lettuce diseases and harvest a banner crop of elegant heads which fill to bursting your boxes, you must be optimistic enough, on receipt of the following wire from your commission man — "Lettuce arrived in bad shape, market very low, will have to dump car. Please send check to cover charges," to reply by night letter, sending check to cover freight — "Sorry market is off, have another car loaded, three more must be cut immediately, do best you can."

Some growers have been fortunate enough to grow maximum crops and get high prices, but most of us have to be satisfied with a very modest average price. Someone has wisely said: "After a man has successfully encountered the bulls and bears of Wall street he is just ready to enter the lettuce business."

Another philosopher has very sagely advised: "If you contemplate going into the lettuce business, do not do it; buy a cow instead."

It's an easy crop to harvest,
And a lovely crop to grow,
It may fill your purse with dollars
Or your heart with bitter woe.

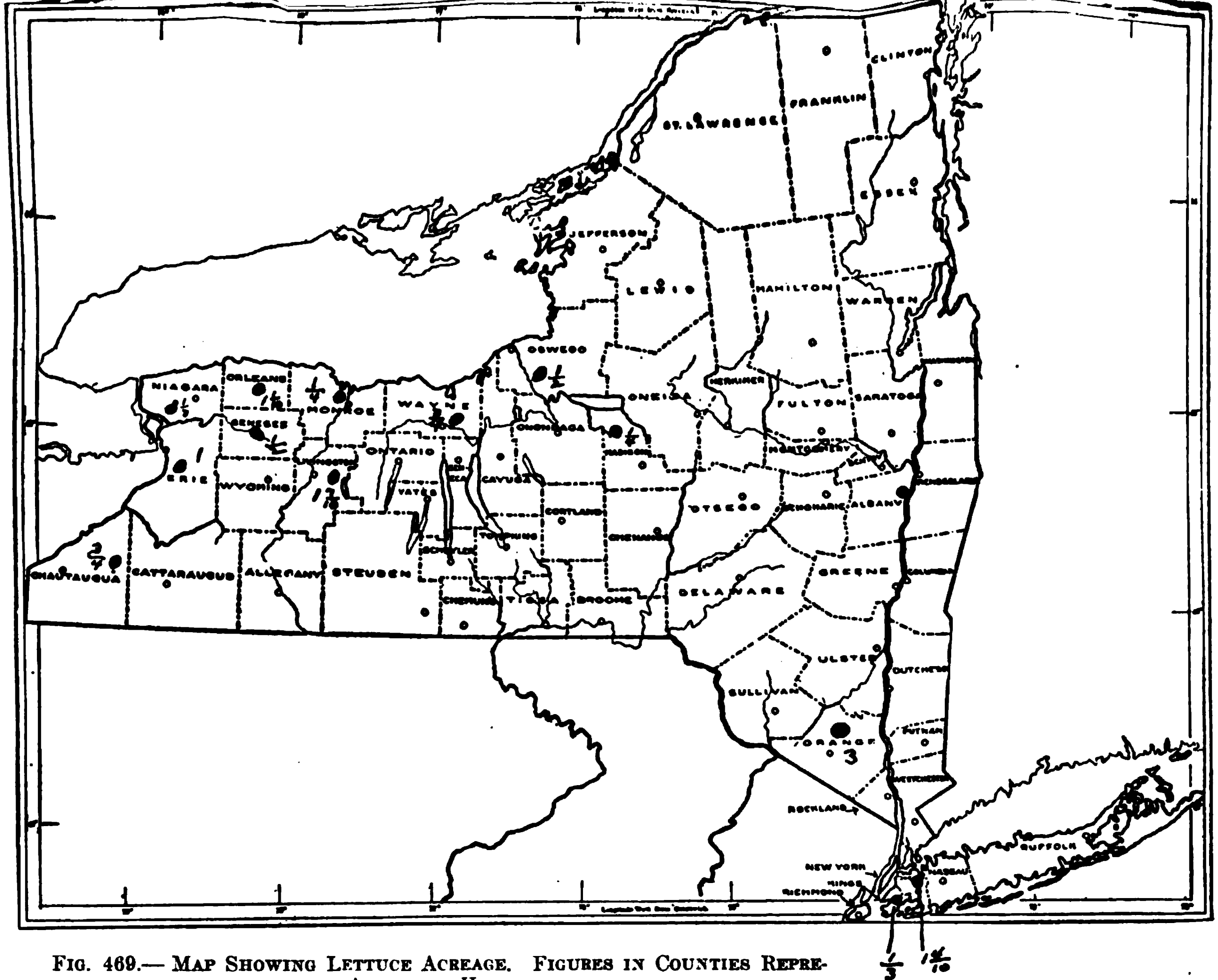


FIG. 469.— MAP SHOWING LETTUCE ACREAGE. FIGURES IN COUNTIES REPRESENT ACRES BY HUNDREDS

ACREAGE AND VALUE OF LETTUCE GROWN IN NEW YORK STATE, BY COUNTIES

(Taken from U. S. Census 1910)

County	*Acres*	*Value*
Albany	11	$3,215
Allegany	....	....
Bronx	....	....
Broome	2	2,500
Cattaraugus	....	....
Cayuga	2	500
Chautauqua	5	800
Chemung	....	....
Chenango	....	....
Clinton	....	....
Columbia	....	....
Cortland	....	....
Delaware	....	....
Dutchess	....	....
Erie	99	17,811
Essex	....	....
Franklin	....	....
Fulton	....	....
Genesee	20	4,300
Hamilton	....	....
Herkimer	....	....
Jefferson	....	....
Kings	31	5,930
Lewis	....	....
Livingston	166	40,489
Madison	....	....
Monroe	25	4,368
Montgomery	....	....
Nassau	16	2,300
New York	1	40
Niagara	12	3,200
Oneida	5	700
Onondaga	6	$3,100
Ontario	3	439
Orange	303	90,939
Orleans	108	41,810
Oswego	9	3,633
Otsego	....	....
Putnam	....	....
Queens	143	46,120
Rensselaer	....	....
Richmond	15	5,000
Rockland	....	....
St. Lawrence	....	....
Saratoga	....	....
Schenectady	....	....
Schoharie	....	....
Schuyler	....	....
Seneca	2	115
Steuben	....	....
Suffolk	....	....
Sullivan	....	....
Tioga	....	....
Tompkins	....	....
Ulster	4	1,000
Warren	....	....
Washington	....	....
Wayne	21	8,350
Westchester	3	2,400
Wyoming	....	....
Yates	....	....
The State	1,012	$289,059

SWEET CORN

A. E. Wilkinson

Extension Instructor, Department of Vegetable Gardening, Cornell University, Ithaca, N. Y.

Sweet corn is a native of America, but has been introduced into other countries. It is one of the most important garden crops in many parts of the United States, being grown largely both for immediate consumption and as a canning crop. It delights in warm weather, although it is more successfully grown in the northern parts of the United States than in the southern.

SOILS

Sweet corn seems to be cosmopolitan as to its soil requirements. It does best on a fairly rich loam. It is not advisable to plant it on soil which is too hard or clayey, and therefore rather backward, as satisfactory results may not be obtained. Sandy or gravelly loams, or even a silty loam, will give very good results, especially if they are prepared deeply. In the rotation, corn follows any other crop very satisfactorily. As a general rule, corn is grown where sod, preferably clover, has been inverted.

PLOWING

The land should be plowed deeply, early in the spring. Six and one-half to seven inches or even deeper is none too much. Care should be taken not to incorporate too much of new subsoil with this top soil, from one to one and one-half inches being sufficient in any one year. Following the plowing, thorough harrowing should be given; that is, the ground should be gone over three or four times rather than only once. Good tools for this work are the disc harrow, used twice over the piece, followed by the spike-tooth used several times. If the land is plowed early, especially sod land, and thoroughly harrowed, a larger amount of water will be conserved, particularly if harrowing follows soon after each rain.

MANURE OR FERTILIZER

Where manure is available, from ten to fifteen tons per acre applied broadcast is advisable. Where the soil is of a relatively heavy type and backward, application of fertilizer in addition to manure is advantageous, using two hundred and fifty to five hundred pounds of a high-grade. Where manure is not available, a fertilizer containing 4 per cent. nitrogen, 8 per cent. phosphoric acid, and 5 per cent. potash, applied in the hill at the rate of about five hundred pounds per acre, will give satisfactory results. This fertilizer would be of greater value where a sod had been inverted than on bare ground.

VARIETIES

Canning

In the eastern United States for an early corn the variety used for canning is the Improved Crosby. This is a second early corn with an ear of fairly large size and very choice kernels. Owing to its earliness the grower is practically assured of obtaining a crop. Stowell's Evergreen is the standard late corn for canning. Very large ears and white kernels of high quality are its characteristics. However, in the last two or three years, owing to the early frosts in the fall and the length of season required to grow this corn, it has proved a failure. Country Gentleman is a good type of corn where shoe-peg kernels are desired. The ears are fairly large and the kernels deep, being placed irregularly on the cob. For the best results where one must consider the season, in order to obtain corn for canning, it would be advisable to depend upon early sorts rather than late. It is well to take advantage of improved types of seed.

Market Gardening

The market gardener has a long list of varieties from which to choose. Only a few will be given here.

Extremely early: Peep-o'-Day, First of All, Red Cob Cory, White Cob Cory.

Second early: Improved Crosby, Squantum.

Main season: Black Mexican, Kendall's, Country Gentleman.

Late: Stowell's Evergreen.

Other sorts may be as good or better. Each grower should test them and select the best for his conditions. Many growers do not care to purchase seed, but raise their own, often obtaining a strain that for their conditions is far superior to any sort they can buy.

Home Gardens

The home gardener may choose any of the sorts mentioned above or from any of those recommended by reliable seedsmen. Many home gardeners are favoring a yellow sweet corn. The Golden Bantam or its improved selection may be used to supply this taste. Plantings in succession of just this one variety should give corn throughout the period desired.

PLANTING

Where corn is to be grown with horse culture, the rows should be from thirty to forty-two inches apart, five or six seeds being planted in a so-called hill, the hills being from eighteen to thirty-six inches apart in the row. Later, thin so that but three strong stalks remain in each hill. Where all hand work is to be practiced, the rows may be somewhat closer — from eighteen to twenty-eight inches apart — and the hills may be the same distance apart in the row as mentioned for horse culture. In some instances planting in rows and later thinning plants to one foot apart may be practiced. The seed should be planted not deeper than one and one-half inches; one inch is even better. Straight rows should be insured by the use of horse or hand-drawn marker, or even on a small scale with the garden line.

Corn should not be planted too early; as a general rule not until after danger of frost is past, probably May 15 to June 1, or even a little later in some locations. The late planting will give ample opportunity for the soil to warm up. The seed may be planted by hand, the grower passing down the row, and, by the use of a hoe, removing a small portion of dirt where the hill is to be located. Fertilizer may be placed in this excavation followed by a little soil. Three to eight seeds are then dropped over this soil, covered and firmed. Pressure of the soil should be given against the seed. It is posible to use the man-power drill machines for planting, dropping seed either in hills or drills. Where these machines are used, the fertilizer would have to be broadcasted by hand or otherwise. Where the ordinary farm corn planter is available, this may be utilized. For large areas a two-row, two-horse planter is a very practical machine to use. It is sometimes greatly to the advantage of the grower to use the hand method, owing to the fact that the patch may be marked out in two ways, and the corn planted at the intersection of these marks. It is then possible to cultivate both ways, resulting in a decreased amount of hand hoeing, or none at all.

CULTIVATION

Clean culture should be given at all times. Corn roots are relatively surface feeders. Therefore, only shallow cultivation should be practiced. For horse tools the twelve-point cultivator is recommended. The fine teeth are made in such a way that if properly handled they need not dig deeply into the soil. For hand tools, the many wheel hoes are useful. Coupled with these tools, of course, the hand hoe is recommended, especially for work close to the plant. During the summer it would be advisable to remove the sucker growths that come out from around the base of the stalk, as they have a tendency to decrease the productiveness of the plant. Corn is not able to withstand drouth as well as many other crops. Therefore, conservation of moisture by maintaining a dust mulch is essential.

PESTS

Diseases. The same smut that attacks field corn is found growing on sweet corn. To combat the disease, the following is recommended: soil free from the disease, which means rotation of crops; eradication of portions of the plant found diseased; and care not to apply manure containing smutted fodder.

Insects. The corn ear worm or bollworm is injurious to sweet corn in several sections of New York State. There is no satisfactory remedy.

HARVESTING

In harvesting the corn, the ears should be removed from the stalk with care. Do not break the stalk in severing the ears. Do not press so tightly against the ear that the kernels will be destroyed. When the silk at the end of the corn has become dried and brown in color, the corn, as a rule, is ready for harvesting. However, this is not always a reliable indication of maturity on the part of the kernel. If the ear appears plump and mature, it is ready to harvest. If one is not experienced in this regard, it may be best to open the husk slightly and view the kernels. They should be in the milk stage, large, dull white, (not glossy), and soft. Then one is practically sure of the condition of the corn.

MARKETING

For canning, the ears may be gathered in baskets or boxes as picked, dumped into a wagon and, when a load is ready, carried immediately to the cannery. The grower is credited the weight of the corn, kernels, husks, and cob.

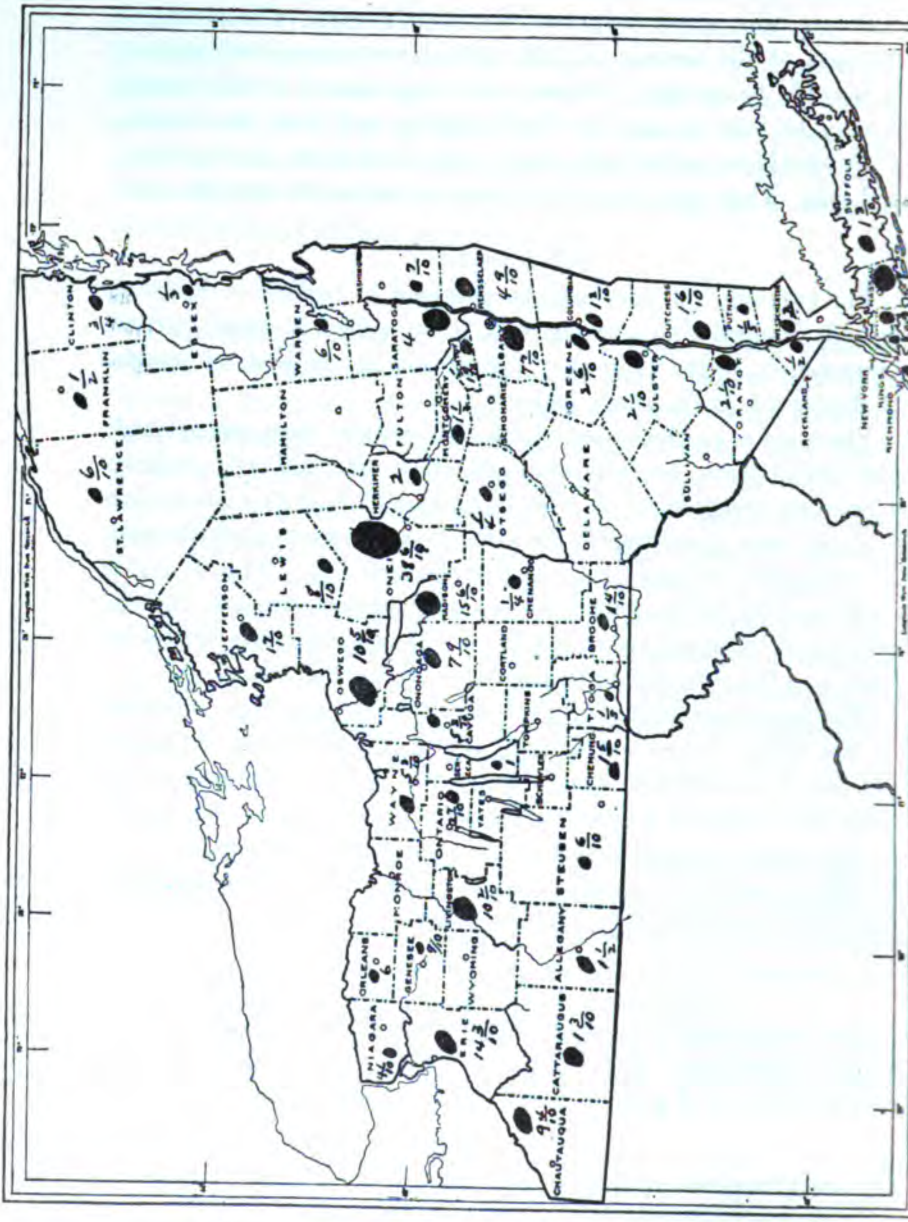
The market gardener would take his corn to the packing shed, and should there carefully grade the corn and pack each grade in a separate receptacle. A bushel box should hold from forty-five to eighty ears, according to the size. Some growers pack the ears for shipment in bags, one hundred in each bag. This is not a good practice, because the corn is easily bruised, becomes heated, and is not in an attractive condition. Boxes or baskets should be used, and the corn should be packed to attract the eye.

The home gardener can go out in the garden thirty minutes or less before dinner and harvest the corn direct from the plant, placing it immediately in the water for cooking, and enjoy it a little later with the guarantee that it is as fresh as one can get it.

After the corn has been removed from the entire plot, or frost has destroyed it, the stalks should be severed from the roots and the garden made as attractive as possible.

YIELDS

One can obtain from eight thousand to nine thousand ears per acre or from two and one-half to five tons of corn ears. A small patch of corn will give the home gardener ample returns.


CLINTON
ESSEX
FRANKLIN
ST. LAWRENCE
WARREN
HAMILTON
SARATOGA
FULTON
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
SCHOHARIE
COLUMBIA
GREENE
DUTCHESS
PUTNAM
ULSTER
ORANGE
SULLIVAN
DELAWARE
ROCKLAND
WESTCHESTER
NEW YORK
KINGS
RICHMOND
SUFFOLK
NASSAU
HERKIMER
LEWIS
JEFFERSON
ONEIDA
OTSEGO
MADISON
CHENANGO
OSWEGO
ONONDAGA
CORTLAND
BROOME
CAYUGA
TOMPKINS
TIOGA
CHEMUNG
SCHUYLER
SENECA
YATES
WAYNE
ONTARIO
STEUBEN
MONROE
LIVINGSTON
ALLEGANY
GENESEE
WYOMING
ORLEANS
NIAGARA
ERIE
CATTARAUGUS
CHAUTAUQUA

ACREAGE AND VALUE OF SWEET CORN GROWN IN NEW YORK STATE, BY COUNTIES

(Taken from U. S. Census 1910)

County	*Acres*	*Value*	*County*	*Acres*	*Value*
Albany	772	$35, 661	Oneida	3.857	$118, 058
Allegany	152	3, 236	Onondaga	791	31,089
Bronx	....	....	Ontario	275	5,568
Broome	141	7,056	Orange	215	10, 381
Cattaraugus	135	5, 485	Orleans	596	14,802
Cayuga	533	14,932	Oswego	1,047	22,239
Chautauqua	938	27,399	Otsego	27	1,864
Chemung	134	8,832	Putnam	19	1,005
Chenango	26	799	Queens	1,179	64,060
Clinton	65	2,566	Rensselaer	493	15,222
Columbia	118	4, 027	Richmond	106	4,641
Cortland	....	....	Rockland	49	2,979
Delaware	10	653	St. Lawrence	62	1,998
Dutchess	163	6,849	Saratoga	400	14,972
Erie	1,430	58,065	Schenectady	188	9, 128
Essex	34	1,575	Schoharie	3	213
Franklin	44	1,942	Schuyler	7	220
Fulton	39	2,348	Seneca	95	2,004
Genesee	82	1,768	Steuben	61	2,037
Greene	260	3, 281	Suffolk	130	6,867
Hamilton	1	20	Sullivan	17	455
Herkimer	202	6,993	Tioga	20	1,104
Jefferson	170	6,264	Tompkins	12	2,100
Kings	167	18,291	Ulster	206	10,549
Lewis	83	1,323	Warren	62	2,819
Livingston	1,017	26,973	Washington	66	3,198
Madison	1,557	30,715	Wayne	535	11,189
Monroe	1,023	47,327	Westchester	205	24,169
Montgomery	150	9,258	Wyoming	7	333
Nassau	3, 128	203,082	Yates	15	633
New York	9	1, 360			
Niagara	411	18,020	The State	23,739	$942,023

POP CORN

J. G. Curtis, Rochester, N. Y.

Farmers' Institute Lecturer

The growing of pop corn is attracting more attention than formerly as it has proved to be a very satisfactory money crop where the conditions are favorable.

The pop corns are a special group of flint corns used for "popping" as the name suggests, for eating out of hand or in confections. They are characterized by the small size of the kernels and their excessive hardness, and by the large proportion of horny substance contained in the kernels, which consists of a large percentage of moisture and gives the kernels the property of popping, or turning almost completely inside, out on the application of heat.

The stalks of pop corn are considerably smaller than those of field corn, but on good soil will average about eight feet in height.

The actual popping of the kernels is due to the expansion of moisture in the starch cells, the application of heat converting the moisture into steam, making the cell walls give way and causing an explosion with sufficient force to change the kernel into a large, irregular, flaky mass that has an especial value as an edible product.

While in popping it loses in weight about 10 per cent., due to the evaporation of moisture by the heat employed, it should increase in bulk in the ratio of about sixteen to one. There are several factors which control this result, such as the even application of the heat and the condition of the corn. It may be too damp or too dry for best results, and, since the moisture content is high when the corn is harvested, it is usually held over one season before marketing.

DISTRIBUTION

Pop corn is grown successfully throughout the northern half of the United States wherever other corn can be grown, and at one time was grown in nearly every garden in New York and the New England states, but it has gradually come to be a sort of special farm crop grown in a commercial way by men who have found it profitable and have made the growing, handling and marketing of it a special study. The great bulk of the crop is now grown in Iowa, Michigan, Illinois, Wisconsin and Nebraska.

VARIETIES

There are about twenty-five different varieties of pop corn, but these are simply variations of the two distinct types or classes known as rice corn and pearl corn. The rice corn has kernels more or less pointed, and sometimes called "squirrel tooth." The pearl corn has kernels rounded or flattened over the top and are very smooth. These two classes may be divided into early, medium and late, and these again into white, yellow, and colored (not yellow). All of these varieties cross with each other so readily that it is difficult, under ordinary methods, to keep a variety strictly to any given type. The different varieties of both the rice and pearl corn may vary as to color through the several shades of white, amber, yellow, red, and black; also red and white striped. Some of the best known white varieties are the Monarch Rice, Snowball and Egyptian. Of the white pearl varieties, the Common White Pearl, Mapledale, Prolific and Nonpareil are standard varieties. Of the yellow pearl varieties, the most valuable are Queens Golden and Dwarf Golden, each of which has a yellowish color when popped and has the taste peculiar to yellow corn. In some localities the black varieties are quite popular and said to be very prolific.

SOIL AND FERTILIZERS

Any well drained fertile soil, except a low peaty or muck soil, is suitable for the growth of pop corn.

Whether the soil is sand, gravel, loam or clay, it must have a sufficient quantity of available plant food elements to give best results. In furnishing any or all of these, one should remember that they are not needed to grow any specific crop, but rather to overcome deficiencies of available plant food in that particular type of soil. All of these types of soil are usually lacking in available nitrogen unless well supplied with humus, and it should be supplied in large applications of organic matter, either in stable manure or by the use of cover crops; and even then there is apt to be a deficiency of available nitrogen early in the season, which should be supplied by a broadcast top-dressing of nitrate of soda at the rate of one hundred to two hundred pounds per acre. The application is made when the corn is two or three inches high. For best results the mineral elements, phosphorus and potassium, should also be applied at the rate of four hundred pounds of acid phosphate (14 per cent. available) and one hundred pounds of potash (50 per cent. actual) per acre; these to be mixed together and drilled into the soil broadcast with the fertilizer drill three or four inches deep, before planting.

SEED

The careful selection of seed corn from the field is one of the important factors of success in growing pop corn, and it is a good practice to grow the seed for the next year's planting in a plot by itself, where the tassels may be removed from all poorly developed and barren stalks before they have shed their pollen. In this way we can do much toward breeding up our seed corn to the special type best suited to our needs, in the same way that we breed our animals for special purposes.

PLACE IN ROTATION

When grown in a regular rotation of crops, pop corn usually takes the place of ordinary field corn and for much the same reasons. Sometimes it is grown in place of one of the "money" crops, such as potatoes. This is often the case when the soil is too heavy for potatoes. The rotation then has to be arranged so that the pop corn and field corn are not grown in adjoining fields, as the pollen is carried by the wind and they become mixed very easily, which affects the quality and appearance of the pop corn.

PLANTING

The seed should be planted about May 25 to June 5, in the latitude of Central New York, or as soon as the ground has warmed up so that the seed will germinate and not rot. The planting should be done with a corn planter or an ordinary grain drill, making the rows three and one-half feet apart and dropping the kernels about eight inches apart in the row.

SUBSEQUENT CARE

The field should be rolled at once after planting, and it should be gone over crosswise of the rows with a slant-tooth harrow or weeder every five or six days until the corn is six or eight inches high. This will tear out a little of the corn, but more has been sown than was needed so as to allow for this. It is a large number of well developed ears rather than stalks that we are trying to obtain. The balance of the season the cultivation should be the same as for ordinary field corn. Pop corn ripens in one hundred to one hundred and thirty-five days from planting, according to the variety, weather conditions and other factors. The maturity can be hastened to some extent by a liberal application of the phosphatic fertilizer. On the other hand, it is retarded by the use of large quantities of stable manure, which gives an excess of nitrogen late in the season. It is especially important that pop corn should ripen before frost comes, since, if injured for popping, it has little value for anything else.

HARVESTING AND STORING

Pop corn is harvested the same as other field corn and is usually husked by hand. The price paid for husking by the bushel is usually 50 per cent. higher than for field corn, as the ears are much smaller. When it is to be stored the cribs are usually lined inside with ¼-inch mesh woven wire netting to protect the corn from rats, mice, squirrels and other vermin. The great difficulty in keeping pop corn from one season to another without having it destroyed by rats or mice, is the chief reason why the business has gradually come into the hands of a comparatively small number of growers who are especially equipped for handling it successfully.

YIELD

A bushel of ears of pop corn when husked weighs 38 pounds, but when cured one season the standard weight is 35 pounds. There are 7 pounds of cobs in each bushel of ears, so that 2 bushels of ears (70 pounds) make 1 bushel of shelled corn (56 pounds) after shelling and removing 14 pounds of cobs. Sixty bushels of ears per acre is considered a good yield, although some growers have bred up their seed until, with liberal feeding and careful cultivation, they obtain between 80 and 90 bushels per acre.

MARKETING

Pop corn is marketed in many different ways. The western grower usually raises it on contract at so much per pound shelled, or sells the entire crop to one of the large dealers in the West who supplies the wants of the trade throughout the country. The shelled corn is sometimes packed in one-pound boxes for the retail grocery trade, but for best results in popping it should be left on the cob until ready to use. It seems there is always enough moisture in the cob to keep the chit end of the kernel from becoming too dry and hard.

The eastern growers usually sell it to the grocer in nearby towns at about one dollar per bushel of ears, and the grocer retails it in small lots at five to eight cents per pound. Some of the larger growers ship their entire crop in barrels to wholesale grocers in the large cities where it is sold on account.

MUSHROOMS

P. K. NOTT, TROY, N. Y.

INTRODUCTION

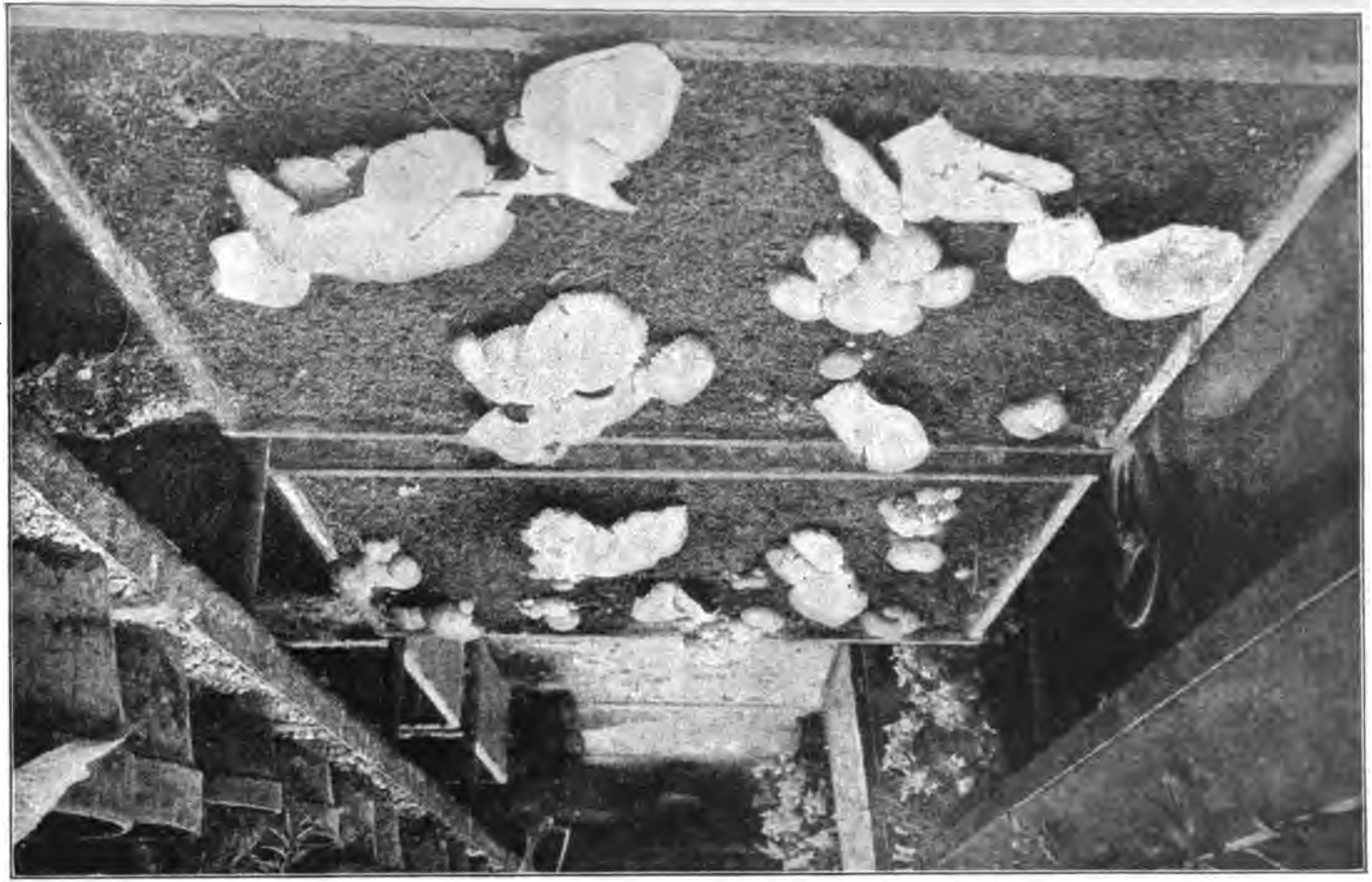
Since this article is intended for general circulation, technical details are purposely omitted, and an effort has been made to treat the subject in a manner to assist the amateur rather than the professional grower, for the commercial growing of mushrooms has been developed into a highly specialized industry. The novice who wishes to take it up as a business would do well to first serve an apprenticeship with some commercial grower and learn it literally from the " ground up."

Many read alluring advertisements of " money in mushrooms " and, with visions of easy wealth, are tempted to invest in a liberal supply of spawn, only to realize their own inefficiency and awaken to the fact that too often, alas, the interest of the advertiser ends with the sale of his goods.

Mushrooms can hardly be considered one of the necessities of life but rather a luxury, for in actual worth as fuel for the human machine, one pound of good round steak is equivalent to nine pounds of mushrooms. It is not to be disputed, however, but that they constitute a decidedly welcome addition to the bill of fare, whether served alone or in combination with various meat dishes, and a person who has acquired a liking for them will derive a pecuniary as well as gastronomic satisfaction in being able to produce his own supply.

LOCATION

The first requisite for the successful growing of mushrooms is a proper place where atmospheric conditions — temperature and moisture — can be controlled. It is imperative that a uniform



temperature of from 55 to 60 degrees F. be maintained constantly. At the same time both beds and air must be kept moderately moist, with ventilation so under control as to avoid stagnation of air, which is apt to result in disease and decay.

These conditions may be secured in a cellar, cave, shed, barn, or under greenhouse benches. The matter of light and darkness must be controlled also, since the best crops are produced in the dark; but this can be secured through the use of screening material.

COMPOST

The next item is the compost and its preparation for the beds. The requirements are simple, but the process must be carried out with the greatest care or failure is bound to result. Fresh, strawy stable manure must be procured. Leave in the straw but throw out any coarse weeds or stems. Sprinkle this until it is well dampened, turning and forking it over while wetting until the entire pile has a uniform degree of moisture. A safe moisture test is that of compression. The mass should have just what water it will hold without squeezing out under moderate pressure.

After dampening, pile up, pressing down with a fork while piling. The finished pile should be about three feet thick or high. Within a short time this begins to decompose and in so doing generates heat which hastens the process of decomposition. This should not, however, be allowed to develope too far or the heat will become so great as to burn, and ruin the compost. For this reason, therefore, the pile should be pulled apart at the end of four or five days, moistened slightly during the operation, forked over and re-piled.

In about eight days more repeat the operation and at the end of another eight days the compost should be ready for use. This can be determined on opening the pile by noting the change in the color of the straw from yellow to brown. It should also be softened enough to break easily, and the odor will have changed, the rank " manure " smell being changed to a sweeter one.

PREPARING THE BEDS

It is assumed that the mushrooms are to be grown indoors in beds, and for these the compost is now ready. The beds, if elevated from the floor, should be constructed three feet wide and ten or twelve inches deep, and should be put in place while the process of compost making is going on, so that there will be no delay when the time comes for filling. Rough boards will answer as it is not necessary that the boxes be tight.

Spread the compost evenly in the beds, pressing down firmly as each successive layer is added; continue until the filled bed has a uniform depth of about eight inches. Place a thermometer in the center of each bed, plunging the bulb a couple of inches below the surface.

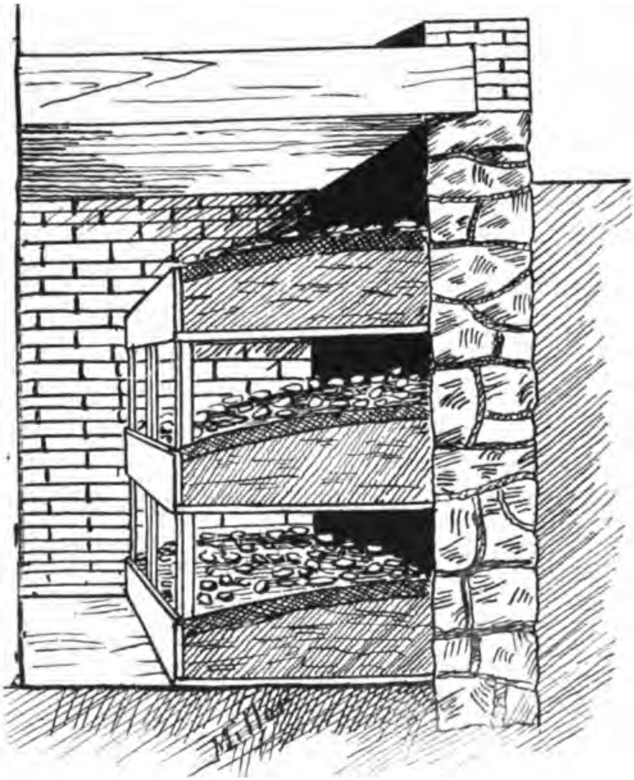


FIG. 472.—SHELF BEDS IN WARM CELLAR

In a short time the second stage of decomposition will set in, causing a rise in temperature. In from five to eight days, however, this should be over, and when the heat has fallen to from

70 to 75 degrees, the beds are ready for planting with the prepared spawn. This process is known as "spawning."

The spawn (described later in this article) commonly comes in dried cakes, called bricks. Break these bricks into pieces from one and one-half to two inches square, and place on edge in the compost, spacing them about twelve inches apart each way, and covering them to a depth of two inches.

Give the beds a light sprinkling, sufficient to maintain a proper degree of moisture, which experts set at 40 per cent., but which may for all practical purposes be determined by the "squeezing" test.

CARE WHILE GROWING

In about ten days the spawn should be running, which will be indicated by fine white threads spreading outward from each piece. In case any plantings have failed to start, remove them and insert fresh ones. The beds should then be covered evenly, about one-inch thick, with fine, moist garden loam, pressed down firmly. This should be watered lightly from time to time as needed to maintain a damp surface. Use lukewarm water and apply with a fine spray, preferably from a watering pot. If the beds are conveniently located, moisture may also be controlled by spraying the walls and floors. Burlaps hung along the fronts of the beds may likewise be sprayed, and this will assist in keeping both air and beds moist.

BEARING SEASON

Bearing should begin within from six to eight weeks from the time of spawning and continue for two or three months. Estimates of yields vary from one-half pound to two pounds per square foot of area and market values run from twenty to sixty cents a pound wholesale and twice that at retail.

The picking should be done as fast as the mushrooms attain the proper size, usually every other day; although daily gatherings are sometimes necessary. They are the best size for picking when the "veil" or tissue on the under side of the cap has begun to break.

The method of picking recommended by experts is to take hold of the cap and remove by twisting, which brings the stem away with the cap. If the product is to be sold most of the stem should be cut off and the cap brushed lightly to remove any traces of soil. For marketing, mushrooms are usually packed in baskets, the size holding four pounds being the most popular. These should be lined with paraffined paper, preferably blue in color, which makes an attractive package and one in which the mushrooms keep well.

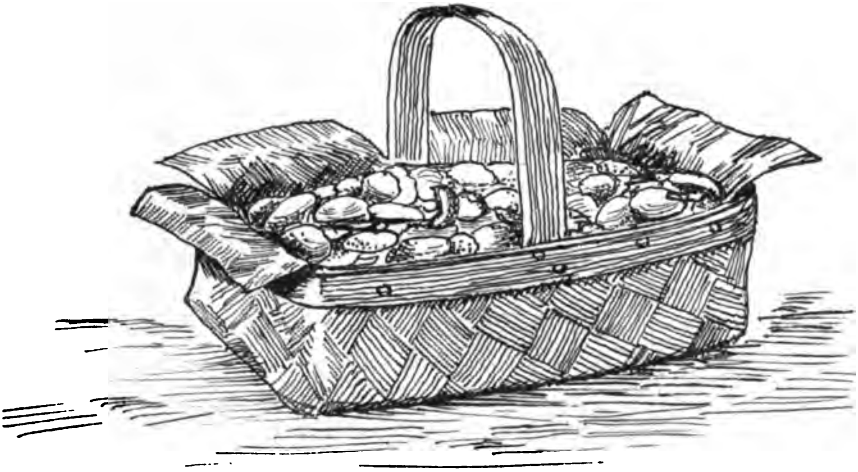


FIG. 473.—MUSHROOMS ATTRACTIVELY PACKED FOR MARKET

When a bed becomes exhausted its use for mushroom growing is over, although it makes an excellent garden fertilizer. It must be cleaned out thoroughly, all woodwork whitewashed, and the building or room fumigated, after which preparation may be made at any time for a new crop, starting with fresh material as in the beginning.

INSECTS AND DISEASES

The mushroom has some insect enemies, chief of which are sow bugs or wood lice. These may be controlled by poisoning. Dip pieces of potato into a strong solution of arsenic or paris green and put them in small yellow boxes or tins with some dry rubbish. These boxes placed on the beds will attract, kill and collect the bugs in one operation.

Snails sometimes cause trouble but these are easily caught by using lettuce or cabbage leaves.

A small insect called "springtail" appears at times where mushrooms are grown in caves, but this condition is due mainly to carelessness in cleaning out. The larvae of a species of small fly is also injurious on occasions but both of these latter may easily be destroyed by fumigating with carbon bisulphide.

Mushrooms are subject to some diseases, but as these are chiefly the result of improper conditions and lack of care they may be avoided by securing the right conditions and exercising care in handling the growing crop.

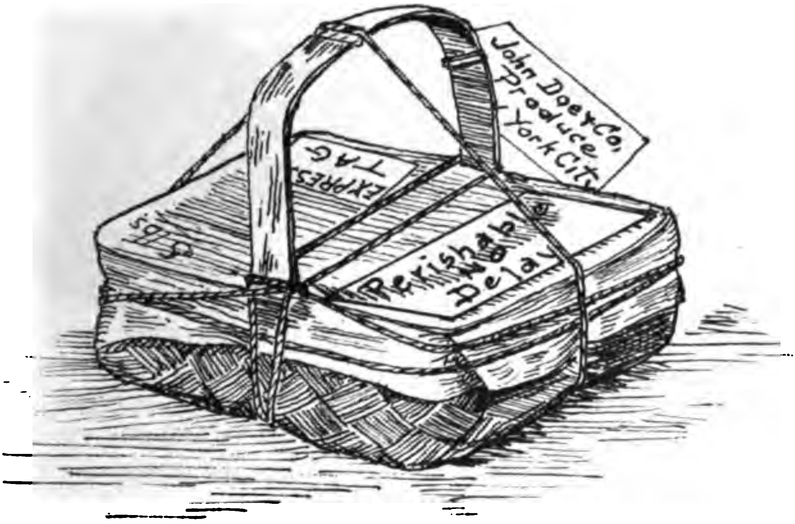


FIG. 474.— PACKAGE READY FOR SHIPMENT

MUSHROOMS AS CATCH CROP

In addition to the bed method, mushrooms are often grown in cool greenhouses such as are used for carnations and vegetables. In such cases the pieces of spawn are buried directly in the rows, between the plants, and are given no special care, being put in simply as a catch crop. The expense of planting is not great and the results are often surprisingly good.

They have also been grown in the same way in kitchen gardens among coarse-leaved plants such as beans, which furnish a maximum amount of shade.

A measure of success too has been attained from plantings made in lawns and pastures during the summer time, the crop appearing in the fall. Only well-drained spots should be selected and the spawn inserted just below the turf.

These methods are, of course, haphazard, but if the season should be favorable the results are well worth the slight expenditure for spawn.

ABOUT SPAWN

The three leading types of spawn on the market are: French or flake, English and American. The latter two are in brick form. Of the three varieties, the French is probably the least desirable as it dries out more quickly than the others, and fresh spawn is always the most desirable. The American is probably the best and is used more extensively than any other. It is scientifically prepared and moreover the purchaser has the opportunity of selection of type according to style, size, hardiness, yield and color.

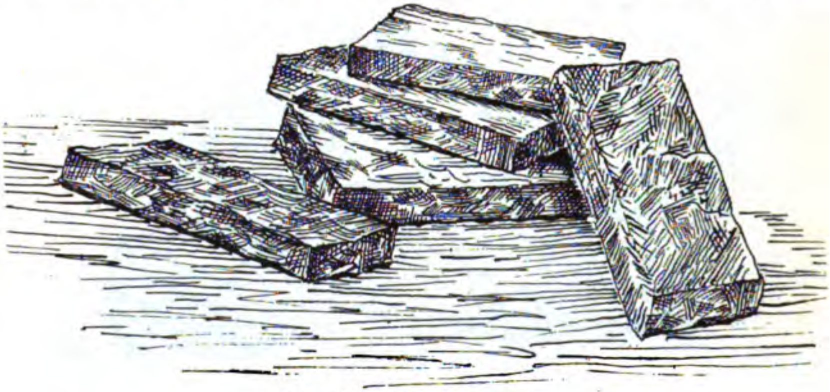


FIG. 475.— BRICK SPAWN

All of the leading seed houses carry the different kinds in stock, both American and foreign, and can fill orders on short notice.

SUMMARY

In conclusion it will be well to emphasize the important points in mushroom culture, namely: proper preparation of manure and beds; careful attention to moisture supply; fresh spawn, and above all, care — constant watchful care — from start to finish, omitting no details, but giving attention to them at the proper time and not twenty-four hours afterward when the damage may be done and the prospects of a crop ruined.

HORSE RADISH

EDWARD VAN ALSTYNE, KINDERHOOK, N. Y.
Director of Farmers' Institutes

CONCERNING THE CROP

Horse radish is now extensively used as a condiment by hotels and restaurants during the entire year. The demand is increasing and the price is high, for it is not generally grown as a crop. There are several reasons for this, such as lack of the right kind of soil, the difficulty that when once established it is hard to eradicate, and the fact that formerly there was no established trade for it, it having only been known in a wild state. Were people to grow it generally, doubtless the supply would soon be greater than the demand. Because it can be grown so inexpensively, with a ready sale and good prices, it is to be recommended as a profitable crop where one has the right kind of land near a good market.

For those who like it for home use a couple of dozen plants set in some convenient corner will supply the needs of an ordinarly family. The only attention needed is to keep out weeds and see that new plants are set to replace those taken out.

SOIL

In its native state horse radish is found growing in small plots in swampy places or along streams. Where one has such soil it may be utilized for growing these roots with practically no expense for culture, although when grown under these conditions they will not be so large or smooth as when grown on good soil with abundant cultivation.

Horse radish thrives best on a deep rich soil abundantly supplied with humus. There, with good cultivation such as should be given corn or potatoes, the roots will be large and a goodly amount will be obtained from an acre.

PLANTING

The amount of seed produced is generally small, and much more time and attention is required to start it from seed than from cuttings, as is usually done. These are small roots from four to six inches long and from one-fourth to a half an inch in diameter, discarded when preparing the large roots for market. Such can be purchased from seedsmen for about twenty-five cents a dozen — in large quantities for much less. The tops may be cut off and reset, but thus set they require a longer time to mature than from the cuttings or side roots, and their use is recommended only for the home plat where land is abundant. The cuttings may be bunched in the fall and held in a cellar over winter for spring planting.

For a market crop on tillable land the rows should be three feet apart, with the plants from a foot to eighteen inches in the row. These should be set deep in a furrow, or by using a small bar or dibble to make the hole. Such planting is usually — and is better — done in the spring; but it may be done at any convenient time. If desired, beets, cabbage or some such early vegetable may be grown between the rows the first season. This practice is not to be recommended except where land is scarce or very high in price, as much more hand hoeing is required and the growth of the radish is apt to be checked. When grown by itself a horse cultivator can be used and no other care is needed other than to keep out the weeds.

HARVESTING

The roots should be large enough to dig the second season. They may be dug in the fall or left in the ground all winter as are parsnips. It is usually wise to have a portion of the crop dug in the fall to supply the winter trade, and that required in early spring while frost is in the ground or it is too wet and muddy. The roots may be grated, treated with salt and vinegar, and bottled for future use.

The price received in the market for horse radish ranges from eight to ten cents per pound.

THE IMPORTANCE OF VEGETABLES IN THE DIETARY

IDA S. HARRINGTON

Bureau of Farmers' Institutes, Department of Agriculture, Albany, N. Y.

"Come, ye thankful people, come,
Raise the song of Harvest-Home:
All is safely gathered in,
Ere the winter storms begin;
God, our Maker, doth provide
For our wants to be supplied;
Come to God's own temple, come,
Raise the song of Harvest-Home."
— HENRY ALFORD.

In words like these we give thanks at harvest time for the products of the good brown earth, of summer sun and rain. Too often we fail in the thanks that consist in "safely gathering in" and *using* the bounty of orchard, garden and field. We are told that over one-half of this is wasted by us every year, while over one-half of the world goes hungry.

Our canning club specialist at Washington, Mr. O. H. Benson, is right in saying that the diet of American people consists too largely of meat, coffee, bread, butter, eggs, and patent medicines. Improper feeding is responsible for over 80 per cent. of human ailments. This is not so much a question of over-or under-feeding as of wrong feeding. Good feeding consists of two things: the right food, and the ability of the body to use it. We may starve in the midst of plenty if our digestion is poor. Inefficient powers of digestion may be due to a poor inheritance, to lack of fresh air, or to a lack of sufficient water; but the chief cause is found in a poorly balanced dietary. Poor feeding in childhood is sure to result in poor adult health.

The body's needs have not been met when we have supplied protein foods for the building and repairing of tissue, and starches, sugars, and fats to furnish energy. Such foods as meats, cereals, legumes and eggs, all tend to form acids, and must of necessity be neutralized by a free use of fruits, milk and vegetables. Unless a balance is maintained by these means, and by a liberal allowance of water, there cannot be good digestion. Poor digestion is wasteful of food, of money, and of strength. We further need to use vegetables freely in order to furnish mineral matter to the body. Why buy iron in a bottle when it is to be had in spinach and beans? Or lime, when cabbage and celery furnish it? Why purchase digestive tablets when succulent vegetables stimulate digestion?

In her "Rules for Planning the Family Dietary" Professor Flora Rose tells us that: "A liberal use of vegetables in the diet is necessary because they cleanse and regulate the body, stimulate the intestines, neutralize acids, and purify the blood, correct anaemia and improve the general health by increasing the amount of iron furnished to the blood." She suggests that vegetables, together with fruits, cereals, bread, potatoes and milk, should form the bulk of our food; and that we should largely decrease the amount of meat, candy, preserves, rich sauces, desserts, cakes, etc., to which we have been in the habit of giving so prominent a place.

SOUPS

Vegetables may figure in every course of the meal, from soup to dessert. Cream of vegetable soups are relished by many who have no liking whatever for milk by itself, and such a soup combined with bread and butter, and fruit, furnishes a "balanced meal," simple as it is. Cream soups are made by combining equal parts of vegetable pulp (obtained by draining and forcing through a colander any well-cooked, well-seasoned vegetable) and cream gravy made as follows: Melt one level tablespoon of butter or fat in a saucepan; add one level tablespoon flour and stir till smooth. Remove from the fire. Add gradually one cup of cold milk. Return to the fire and stir constantly for five minutes. After combining the vegetable pulp and cream gravy, thin with hot milk to suit individual taste, and add more seasoning if necessary. Careful seasoning, and variety in seasoning, are essential if we would keep a dish popular with our families. Such season-ings as celery salt, onion salt, paprika, etc., save cream soup from tasting " flat." A little left-over bacon, chopped fine, is especially nice for seasoning cream-of-corn soup.

Rice and Celery Soup

(From "The Housewife" for March, 1915)

Boil 1 cup rice and 2 heads celery in 2 quarts of water till soft. Rub through a strainer, add 1 cup of milk and 1 cup of cream and seasoning.

Carrot Soup

(From "The Housewife" for March, 1915)

Put through a meat-chopper 1 pint of carrots and a green sweet pepper, simmer in 3 pints of water till soft. Rub through a sieve, and add a pint of milk (combined with 1 tablespoon butter and 1 tablespoon flour) and season with salt, pepper and a little nutmeg or powdered mace.

COOKING WINTER VEGETABLES

In spite of the convenience of canned vegetables, there is a value in such vegetables as cabbage and turnips which we must not overlook. To render these vegetables mild and digestible we must cook them quickly in plenty of water with the cover off; change the water two or three times during cooking; and drain off the water when the vegetables are nearly done, substituting a little milk for the final cooking. Avoid overcooking, as this makes cabbage tough and develops the dark color, and the strong flavor and after-taste.

Baked Cabbage

(From the Presbyterian Cook Book, Boonville, N. Y.)

Cut the cabbage in small pieces, boil until tender in salted water. When cold, chop fine, add 2 beaten eggs, 1 tablespoon butter, 2 tablespoons cream. Mix well, put into a buttered pan and brown in the oven.

Boiled Red Cabbage

Red cabbage should be boiled in an uncovered saucepan, but in a small amount of water and without stirring (merely shaking the saucepan occasionally to keep the cabbage from sticking), in order that the attractive color may not be lost. Shred the cabbage, boil as directed for half an hour; then season with salt, add one level tablespoon butter and one tablespoon pork drippings, duck fat or goose fat, and one apple cut in small pieces. Thicken slightly by dredging with a little flour. Cook until the apple is tender enough to be thoroughly mixed with the cabbage.

Fried Onions and Apples

(From the Presbyterian Cook Book, Boonville, N. Y.)

Cut thin slices of salt pork and fry in saucepan. Fill dish with sliced onions and apples, add a little water and cook until brown, stirring often. Add a little pepper.

COOKING SUMMER VEGETABLES

Young, mild-juiced vegetables like green peas, beans, etc., should be cooked slowly in a covered saucepan, with a small amount of water, in order to develop their full flavor. When tender, drain, season with butter, salt and a little sugar. A little milk or cream may be added before serving.

LEFT-OVER VEGETABLES

There are as many possibilities in vegetable left-overs as in those of meat, potatoes or bread. Vegetable hash is highly esteemed in New England, and may be looked for on the day after a boiled dinner. Baked vegetable hash is made by melting one tablespoon of butter in a frying pan, adding 1 pint of mixed chopped vegetables (or any one vegetable alone), 1 pint of chopped potatoes and 1½ cups soup stock. Mix until heated, season well, set in the oven and bake thirty minutes.

Green Pea Croquettes

Take equal parts of left-over green peas and thick cream gravy (made of 4 level tablespoons butter and 4 level tablespoons flour to 1 cup of milk). Season well and cool. Shape into croquettes, roll in bread-crumbs, in beaten egg (adding 1 tablespoon of cold water to each egg) and again in bread crumbs, and fry in deep fat.

Vegetable Salads

Any left-over vegetables such as green peas, beans, asparagus, carrots or beets may be served separately or in combination as a salad. They should be stirred as little as possible, and should be served the day they are prepared. Have them well drained and cold before adding the salad dressing. In general, a French dressing is best adapted to vegetable salads.

Mrs. Lincoln's French Dressing

One saltspoonful salt, ½ saltspoonful pepper, 3 tablespoonsful oil, ¼ teaspoonful onion juice, 1 tablespoonful vinegar or lemon juice. Mix in the order given, adding the oil slowly. The onion may be omitted and a teaspoonful of made mustard may be added. if desired.

Canned-Tomato Salad

Fresh sliced tomatoes make one of our favorite salads, but a good substitute may be obtained during the winter months when we long for something that will add a little "snap" to our meals. To make the canned-tomato salad, heat 1 pint of strained tomato, seasoned with 1 teaspoon salt, a little pepper and 1 teaspoon onion juice. Soak ¼ package of granulated gelatine in a little cold water, and add just enough boiling water to dissolve. Add to the tomato, boil for one minute, strain into small moulds and chill. Serve with salad dressing.

Salad Dressing

(From the Presbyterian Cook Book, Boonville, N. Y.)

Melt 2 tablespoons butter and stir in 2 tablespoons flour in which 1 teaspoon mustard and 2 teaspoons salt have been mixed. Then add 1 cup milk. Cook 2 minutes, then add ½ cup vinegar, 3 well-beaten eggs and 2 tablespoons sugar. Cook until thick. A cup of whipped cream may be added when cold.

VEGETABLE RELISHES

It is not fruits alone that form the basis of jams, marmalades, etc. Carrot may be added to orange marmalade without injury to the flavor, and with considerable lowering of the cost. Tomato relish may be prepared by boiling 2 pounds of ripe tomatoes (scalded and peeled) with ½ cup of vinegar, 1 pound sugar, and a teaspoon of grated ginger root, until thick.

VEGETABLE DESSERTS

Squash, pumpkin, carrot, and sweet-potato pie have as large a following as have apple or mince.

Pumpkin Pie

The only tedious part in the making of a pumpkin pie lies in preparing the pumpkin. There is a " short cut " to this which is not generally known. Bake the pumpkin whole (just as though it was an overgrown apple) until it is tender throughout. By this method it takes but a few moments to separate and mash the pulp. To one cup of this add 1 cup of milk, 1 egg, ½ teaspoon of cinnamon, ½ teaspoon ginger and a little salt. Make a paste by chopping ½ cup shortening into 1½ cups of sifted pastry flour and adding ½ teaspoon salt, and just enough cold water so that the paste can be rolled. Line a deep pie tin with this, fill with pumpkin mixture, and bake till a golden brown.

VEGETABLE SWEETMEATS

Although it is too troublesome a process for the average cook, expert candy makers succeed in producing crystallized carrots,— or glaced carrots as they are called —that compare favorably with crystallized fruits and nuts. This bears out the theory that vegetables may have a place in every course, from soup to dessert, and be excellent in all.

LEGAL WEIGHTS AND MEASURES OF VEGETABLES SOLD IN NEW YORK STATE

JOHN H. FARRELL, ALBANY, N. Y.

State Superintendent of Weights and Measures

Vegetables, like all commodities sold in this state, must be sold either by weight, measure or numerical count.

There are two simple ways in which vegetables may be sold in the state of New York: (1) by the head or bunch, and (2) by weight.

The method of sale by dry measure is far more complex, for, in the first place, when commodities are commonly sold by heap measure the law provides:

> " The measure of capacity for all commodities commonly sold by heap measure shall be the half bushel and its multiples and subdivisions. The measures used to measure such commodities shall be cylindrical, with plain and even bottom, and of the diameter of nineteen and one-half inches from outside to outside if a bushel; fifteen and one-half inches if a half bushel, and twelve and one-third inches if a peck.
>
> "All commodities sold by heap measure shall be duly heaped up in the form of a cone, the outside of the measure to be the limit of the base of the cone, and the cone to be as high as the commodities will admit."

Furthermore, bushels of various vegetables must consist of a definite number of pounds, in the absence of any agreement to the contrary: peas, potatoes or beans, 60 pounds; onions, 57 pounds, sweet potatoes, 54 pounds and carrots, 50 pounds. For a fractional part of a bushel, like fractional parts of the above weights are required. There are similar provisions as to various fruits and grains.

When more than six heads or bunches of vegetables are sold by count, or whenever vegetables are sold by weight or dry measure, the weight, measure or count must be marked on a label or a tag attached to the vegetables; or, if in a container, on the side or top of the container or on a label or tag attached thereto. Where they are not in a container a sales slip may be given under the following conditions:

> " In case of sales of commodities not in containers, when circumstances make it impracticable to place the marking on or attach it to the commodity, a sales slip showing the name of the seller, identifying the commodity sold and showing the required weight, measure or numerical count may be delivered to the purchaser at the time of the sale or delivery, and in such case no other marking will be required. Such sales slip must give in writing the requisite information with equal clearness and distinctness as if marked on or attached to the commodity. The provisions of any regulation requiring the marking to be on or attached to the commodity will not be complied with by the use of a sales slip."

When the sale is made in container, the quantity need not be marked, provided the container is of one of the following sizes: barrel, half-barrel, bushel, or multiples of the barrel, or sub-multiples of the bushel divisible by two.

This is better understood by referring to the regulations adopted by the Superintendent of Weights and Measures pursuant to law:

> " *Containers for vegetables, produce and fruit of standard size.*
>
> " (a) A barrel shall represent a quantity of 7,056 cubic inches or be of the following dimensions: Head diameter, seventeen and one-eighth inches; length of stave, twenty-eight and one-half inches; bilge, not less than sixty-four inches outside; distance between the heads, not less than twenty-six inches.
>
> " (b) A half-barrel shall represent a quantity equal to 3,528 cubic inches. Not being a multiple of the quart, the half-barrel cannot be used as a container for fruit.
>
> " (c) Such containers other than barrels or half-barrels need not be marked if of the following sizes: Two bushels, one bushel, half-bushel, one peck, half-peck, quarter-peck, one quart, one pint and one-half pint.

"(d) In measuring a barrel used or to be used as a container for vegetables, produce or fruit, the capacity thereof shall be ascertained by taking the measurement thereof between heads, or, if the barrel is so made that no top can be inserted therein, then by taking the measurement stricken full. If, when so measured, the contents equal 7,056 cubic inches, no marking need be placed on the barrel; otherwise, it must be marked as provided in section 16-a. Half-barrels shall be similarly measured.

"In measuring containers used or to be used for vegetables, produce or fruit, other than the barrel or half-barrel, the capacity thereof shall be ascertained by taking the measurement thereof to the top of the sides, or if a cover is to placed thereon, which shall come below the top of the sides, then to the lowest point of the cover. In determining such capacity, the standards of measure are the half-bushel, containing 1,075.20 cubic inches, and multiples and sub-divisions thereof of proportionate cubical contents.

"(e) A variation in contents of one and one-half per cent. (1½%) will be allowed, but the variation shall not be uniformly below in a test of twelve containers taken at random."

"*Containers for vegetables, produce and fruit of other than standard sizes enumerated above.*

"(a) When not of the sizes enumerated above, the barrels shall be marked with bold, broad-faced letters at least one inch in height in terms of the fractional part of the barrel; for instance, a barrel that contains three-fourths of a standard barrel shall be marked '¾ barrel.'

"(b) Baskets or containers which are not of the standard size enumerated above, shall be marked in bold, broad-faced letters, at least one-half inch in height, given in terms of dry quarts, dry pints and half-pints or in terms of net weight.

NOTE. This does not in any way affect the contractual rights of the buyer and seller, and when the buyer is entitled to receive heap or special measure, under sections 6 and 8 of the General Business Law, the basis of payment must be such heap or special measure.

"(c) Variations or tolerances shall be allowed of same amount as prescribed in Regulation (2).

"For method of measuring, see Regulation 2 (d)."

If persons selling vegetables will sell by the head, or by weig and will mark the number, or the net weight (or the gross a tare weight) on the side or top of the container, or on a label tag attached to the vegetables, they will always be on the safe si Otherwise they will constantly have to be on their guard as whether or not the container is or is not of a standard size, a if they sell by dry measure, the provisions of the law as to he ing measure, and fixed weight bushels will have to be borne mind.

* GUIDE FOR VEGETABLE GROWERS

Name of vegetable	Seed for 100 ft.	Time to plant seeds			Depth to plant seed (inches)	Time to transplant	Distance apart of rows		Distance apart of plants in rows	Ready for use after planting
		Hot-beds	Cold-frames	Open ground			Horse culture	Hand culture		
Artichokes, globe	1 oz	March	April	May	½	May	3 to 4 ft.	2 to 3 ft.	2 to 3 ft.	15 months
Asparagus	60 to 80 plants			April or May		April or May	3 to 5 ft.	12 to 24 in.	12 in.	2 to 3 years
Beans, dwarf	1 pt	March	April	May to July	1	June	30 to 36 in.	18 to 24 in.	3 to 4 in.	45 to 65 days
Beans, pole	½ pt	March	April	May or June	1	June	3 to 4 ft.	2 to 3 ft.	3 to 4 in.	50 to 80 days
Beets	2 oz	March	April	May to Aug	½ to 1	May	24 to 36 in.	12 to 18 in.	4 to 6 to foot	60 to 85 days
Brussels sprouts	¼ oz	March	April	May, June	½	May, June	30 to 36 in.	18 to 24 in.	12 to 18 in.	95 to 120 days
Cabbage, early	¼ oz	March		April, May	½	April, May	30 to 36 in.	18 to 24 in.	12 to 18 in.	90 to 100 days
Cabbage, mid-season	¼ oz		April	May	½	May, June	30 to 36 in.	24 to 30 in.	16 to 24 in.	100 to 120 days
Cabbage, late	¼ oz		May	June	½	June, July	36 to 42 in.	30 to 36 in.	20 to 30 in.	100 to 130 days
Carrots	1 oz	March	April	May, June	¼ to ½		24 to 30 in.	12 in.	2 to 3 in.	75 to 110 days
Cauliflower	¼ oz	April	May	May, June	½	May, June	30 to 36 in.	18 to 24 in.	14 to 18 in.	100 to 130 days
Celery, early	¼ oz	March		April	⅛ or less	April	3 to 6 ft.	18 to 24 in.	3 to 5 in.	120 to 130 days
Celery, late	¼ oz		April	May	⅛ or less	May, June	4 to 6 ft.	24 to 42 in.	4 to 8 in.	130 to 150 days
Corn, early	¼ pt	April	April	May	1 to 1½	May	30 to 36 in.	18 to 24 in.	Hills 18 to 24 in.	65 to 90 days
Corn, late	¼ pt			May, June	1 to 1½		36 to 42 in.	30 to 36 in.	Hills 30 to 36 in.	75 to 100 days
Cucumbers	½ oz	March	April	May, June	½ to 1	May	4 to 6 ft.	4 ft.	Hills 4 ft.	60 to 80 days
Dandelion	¼ oz		April to Aug.	May	½		24 to 30 in.	12 to 18 in.	12 to 18 in.	6 to 12 months
Endive	1 oz	March	April	June to Aug	½	April	24 to 30 in.	12 to 18 in.	12 to 18 in.	90 to 130 days
Kale	¼ oz		April	June to Aug	½	May	24 to 30 in.	18 in.	18 in.	90 to 120 days
Kohl-rabi	¼ oz	April	April	May to July	½	May	30 to 36 in.	12 in.	12 to 18 in.	60 to 80 days
Leek	½ oz	April	May	May, June	½	May, June	24 to 30 in.	6 to 12 in.	4 to 8 in.	120 to 180 days
Lettuce	½ oz	March	Apr. on	April to Aug.	½	May on	24 to 30 in.	10 to 12 in.	Head 10 in.	60 to 90 days
Muskmelons	½ oz	April	April	May, June	½ to 1	May	6 to 8 ft.	6 ft.	Hills 6 ft.	120 to 150 days
Onions	1 oz	March	April	April, May	½	April, May	24 to 30 in.	1 ft.	2 in.	130 to 150 days
Parsley	¼ oz	March	March	April, May	¼ to ½	April, May	24 to 30 in.	12 to 18 in.	3 to 6 in.	90 to 120 days
Parsnips	½ oz		April	April, May	¼ to ½		30 to 36 in.	12 to 18 in.	3 to 4 in.	125 to 160 days
Peas, early	1 qt		April	April	1 to 2		3 to 4 ft.	18 to 24 in.	Close	40 to 80 days
Peas, late	1 qt			May, June	1 to 2		4 to 5 ft.	24 to 36 in.	Close	65 to 90 days
Peppers	¼ oz	March	April	June	½	May, June	30 to 36 in.	12 to 18 in.	15 to 18 in.	100 to 140 days
Potatoes, early	5 to 8 lbs		April	April	3 to 5		30 to 36 in.	24 to 30 in.	12 to 14 in.	80 to 100 days
Potatoes, late	5 to 8 lbs			May, June	3 to 5		36 to 42 in.	30 to 36 in.	12 to 18 in.	100 to 140 days
Pumpkins	½ oz		April	May, June	1 to 1½		8 to 12 ft.	8 ft.	Hills 8 ft.	100 to 140 days
Radishes	1 oz	March	April	April to Sept.	½		24 to 30 in.	8 to 12 in.	1 in.	20 to 40 days
Salsify	1 oz		April	May	½ to 1		30 to 36 in.	12 to 18 in.	4 to 6 in.	120 to 180 days
Spinach	1 oz	March	April	April, May, August	½		30 to 36 in.	12 to 18 in.	3 to 4 in.	30 to 60 days
Squash	½ oz	April	April	May, June	1 to 1½	May, June	3 to 10 ft.	3 to 8 ft.	Hills 3 to 8 ft.	Bush 60 to 80 days, running 120 to 160 days
Tomatoes	¼ oz	March	April	June	¼ to ½	June, July	3 to 5 ft.	18 to 36 in.	1½ to 3 ft.	100 to 140 days
Turnips	½ oz	March	April	April to Aug.	½	April, May	30 to 36 in.	12 to 18 in.	6 to 10 in.	60 to 80 days
Watermelons	1 oz		April	May, June	1 to 1½	May	8 to 12 ft.	8 ft.	Hills 8 ft.	100 to 120 days

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* Reprint from Cornell Reading Course Lesson, Vol. II, No. 33, Garden Series No. 1.

Table Showing Acreage and Value of Vegetables Produced in New York State by Counties — (U. S. Census, 1910)

County	Acreage of all vegetables not including potatoes	Acreage of potatoes	Value of all vegetables including potatoes
Albany	4,614	3,708	$560,054
Allegany	1,325	13,412	649,420
Broome	1,446	7,106	471,759
Cattaraugus	1,829	7,392	501,663
Cayuga	3,238	8,089	635,210
Chautauqua	4,291	6,329	615,102
Chemung	969	3,724	255,707
Chenango	1,284	4,843	439,100
Clinton	1,059	8,673	594,114
Columbia	1,291	3,144	254,676
Cortland	2,229	4,961	523,515
Delaware	1,094	4,331	371,903
Dutchess	1,679	3,041	386,528
Erie	10,270	2,769	196,928
Essex	662	23,587	1,990,494
Franklin	824	7,273	591,627
Fulton	579	2,485	196,341
Genesee	3,093	9,585	586,620
Greene	1,452	1,948	219,711
Hamilton	101	418	44,514
Herkimer	1,173	4,167	364,461
Jefferson	1,952	5,319	454,184
Kings	848	591	133,448
Lewis	748	4,102	290,954
Livingston	5,435	11,163	803,079
Madison	6,718	4,566	752,130
Monroe	9,491	20,211	1,984,715
Montgomery	1,021	2,007	204,201
Nassau	10,472	8,685	1,763,139
New York	376	38	83,672
Niagara	6,953	6,918	711,847
Oneida	8,715	8,721	1,089,590
Onondaga	8,525	13,794	1,459,496
Ontario	9,426	14,857	1,008,012

County	Acreage of all vegetables not including potatoes	Acreage of potatoes	Value of all vegetables including potatoes
Orange	6,164	3,063	$998,515
Orleans	4,418	4,111	509,996
Oswego	3,126	7,507	612,473
Otsego	7,446	7,946	586,792
Putnam	327	863	99,684
Queens	7,100	2,581	1,408,984
Rensselaer	2,102	10,008	718,573
Richmond	1,634	139	311,944
Rockland	623	958	130,811
St. Lawrence	1,960	7,321	589,215
Saratoga	2,018	7,278	485,423
Schenectady	732	1,135	132,956
Schoharie	823	3,273	219,464
Schuyler	376	3,045	149,554
Seneca	1,440	2,833	206,093
Steuben	2,737	30,524	1,434,758
Suffolk	7,050	15,407	2,339,279
Sullivan	803	3,312	243,741
Tioga	599	5,960	334,936
Tompkins	913	4,908	345,297
Ulster	2,346	4,282	446,927
Warren	844	1,882	165,381
Washington	1,052	10,443	656,588
Wayne	5,622	9,280	844,690
Westchester	1,715	1,757	400,014
Wyoming	952	9,879	601,737
Yates	1,411	2,667	147,805
The State	175,515	394,319	$36,309,544

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Asparagus, *F. M. Hexamer*, Orange Judd Co	$.50
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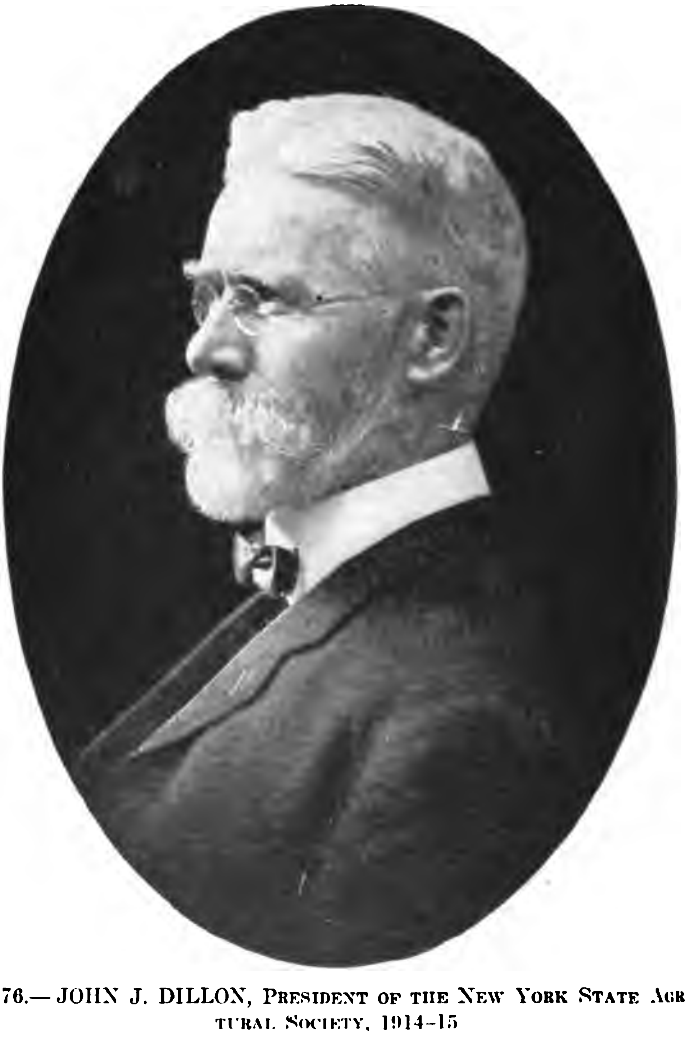

Fig. 476.— JOHN J. DILLON, President of the New York State Agric
tural Society, 1914–15

STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

CHARLES S. WILSON, Commissioner

Bulletin 71

PROCEEDINGS

OF THE

SEVENTY FIFTH ANNUAL MEETING

OF THE

New York State Agricultural Society

IN COOPERATION WITH THE

STATE DEPARTMENT OF AGRICULTURE

1915

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1893	J. B. Dutcher	Pawling.
1894	J. B. Dutcher	Pawling.
1895	I. P. Roberts	Ithaca.
1896	I. P. Roberts	Ithaca.
1897	Benjamin F. Tracy	New York.
1898	Benjamin F. Tracy	New York.
1899	Timothy L. Woodruff*	Brooklyn.
1900	Timothy L. Woodruff*	Brooklyn.
1901	John H. Farrell*	Albany.
1902	F. E. Dawley	Fayetteville.
1903	F. E. Dawley	Fayetteville.
1904	F. E. Dawley	Fayetteville.
1905	Gilbert M. Tucker	Albany.
1906	Gilbert M. Tucker	Albany.
1908	James H. Durkee*	Sandy Hill.
1907	James H. Durkee*	Sandy Hill.
1909	Raymond A. Pearson	Ithaca.
1910	Raymond A. Pearson	Ithaca.
1911	Raymond A. Pearson	Ithaca.
1912	George W. Sisson, Jr	Potsdam.
1913	George W. Sisson, Jr	Potsdam.
1914	John J. Dillon	New York.
1915	John J. Dillon	New York.

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* Deceased.

CONSTITUTION

The style of this society shall be "The New York State Agricultural Society." Its object shall be to improve the condition of agriculture, the rural household and mechanic arts.

Section 1. The society shall consist of such citizens of the state as shall signify in writing their wish to become members and shall pay, on subscribing, not less than one dollar and annually thereafter one dollar; and also of honorary and corresponding members. The presidents of state associations actually working for the improvement of the various branches of agriculture, the presidents of county and town agricultural societies, or a delegate from each shall, ex officio, be members of this society. The payment of ten dollars or more, as fixed by the executive board, shall entitle the donor to life membership and shall exempt him from annual dues.

Section 2. The officers of the society shall consist of a president, nine vice-presidents, one to reside in each judicial district of the state, a secretary, a treasurer and an executive committee of eight additional members. The executive board shall consist of the officers above named; eleven members of the board shall constitute a quorum.

Section 3. The president shall preside at all meetings of the society and of the executive board. In his absence a vice-president shall be named by the meeting as presiding officer.

Section 4. The secretary shall keep the minutes of the meetings of the society and the executive board; he shall conduct all correspondence in behalf of the society.

The treasurer shall keep the funds of the society and disburse them on the order of the executive board, or a duly appointed subcommittee thereof, countersigned by the president of the society, and shall make a report of the receipts and expenditures at the annual meeting in January.

The executive board shall transact the general business of the society and shall perform such other duties as shall seem best calculated to promote the objects of the society.

Section 5. There shall be an annual meeting of the society on the third Wednesday in January, in the city of Albany, at which time all the officers shall be elected by a plurality of votes and by ballot.

The executive board shall have power to fill any vacancies which may occur in the offices of the society during the year. The society may be convened in special meeting by the executive board and fifteen members shall constitute a quorum. No person shall be qualified to vote at any election of officers of the society unless he shall have been a life member for at least thirty days prior to the holding of such election.

Section 6. No officer of the society shall receive any pecuniary compensation for services rendered to or for the society, except on the authority of the society granted at a regular annual meeting.

Section 7. The constitution may be amended by a vote of two-thirds of the life members present at an annual meeting.

PROGRAM

Wednesday, January 20, 1915

In the Assembly Parlor, 10 A. M.

Report of Committee on Membership
Chairman, W. N. Giles, Skaneateles, N. Y.
Appointment of Committees
Report of Committee on Legislation
Chairman, Hon. C. Fred Boshart, Lowville
Report of Committee on Marketing and Transportation
Chairman, Ezra A. Tuttle, Eastport
County Farm Bureaus
M. C. Burritt, Director, Ithaca
T. M. Avery, Delaware County
C. B. Tillson, Clinton County
H. E. Babcock, Tompkins County
Floyd S. Barlow, Otsego County
E. H. Forristall, Cortland County

2 P. M.

Business Meeting
Report of Secretary
Albert E. Brown, Syracuse
Report of Treasurer
Harry B. Winters, Albany
Miscellaneous Business

Reports of Special Committees
Election of Officers
Report of Committee on Development of Agricultural Resources
Chairman, Hon. James W. Wadsworth, Jr., United States Senator from New York
Report of Committee on Publicity
Chairman, H. H. Charles, New York
Report of Committee on Drainage
Samuel Fraser, Geneseo
"Cooperation in Agriculture and the Factors that Make for Success"
Dr. B. T. Galloway, Director New York State College of Agriculture, Ithaca
"A Cooperative Succeess"
S. J. Cook, Silver Creek

The Housewives' League will serve tea to the Farmers' wives from 4 to 6 o'clock

In the Senate Chamber, 8 P. M.
HON. EDWARD SCHOENECK, Lieutenant-Governor, Presiding
President's Address
HON. JOHN J. DILLON, New York
"How to Clarify the Milk Situation"
DR. RAYMOND A. PEARSON, President Iowa State College
"Agricultural Opportunities in the East"
HON. J. H. HALE, America's Greatest Fruit Grower

Thursday, January 21, 1915

In the Assembly Parlor, 9:30 A. M.
Report of Committee on Cooperation
Chairman, CHARLES R. WHITE, Ionia
"Game Laws and the Farmer"
ALFRED C. WEED, North Rose
"Possibilities of the Dairymen's League"
ALBERT E. MANNING, Otisville
Discussion led by F. W. SESSIONS, Utica, and S. L. STEWART, Newburgh
"The Township School System"
HON. THOMAS E. FINEGAN, Assistant Commissioner of Education, Albany
"Farm Hygiene"
DR. LYDIA DE VILBISS, Albany

2 P. M.
"Correlation of Agriculture in New York State"
DEAN H. E. COOK, State School of Agriculture, Canton
"Torrens System of Land Titles"
GILBERT RAY HAWES, New York
Debate For and Against the Single Tax on Land
Affirmative — JAMES R. BROWN, New York
Negative — ALLAN ROBINSON, New York

7 P. M.
Banquet, Keeler's Hotel, Broadway
HON. JAMES WOOD, Mt. Kisco, Toastmaster
Reception to Woman's Club of Albany
Reunion of Former Presidents of the Society
Responses to Toasts by Former Presidents

HON. JAMES W. WADSWORTH, 1885.
HON. W. A. WADSWORTH, 1888.
HON. BENJAMIN F. TRACY, 1897.
MR. GILBERT M. TUCKER, 1905.
DR. RAYMOND A. PEARSON, 1909.
MR. GEORGE W. SISSON, JR., 1912.

MRS. JULIAN HEATH, President National Housewives' League
MRS. ELMER BLAIR, Founder of the Woman's Club of Albany

ANNUAL MEETING

IN THE ASSEMBLY PARLOR, STATE CAPITOL, ALBANY, N. Y., JANUARY 20-21, 1915

WEDNESDAY, JANUARY 20

MORNING SESSION

President John J. Dillon called the meeting to order.

THE PRESIDENT: It is our privilege this morning to open the seventy-fifth annual convention of the New York State Agricultural Society. We have prepared a program for your entertainment and benefit that is quite full. It contains the names of many of our old friends and some new ones. It is quite late and the Chair does not intend to take up any of your time this morning, therefore we will at once plunge into the program as we have it. The proceedings will open with the report of the Committee on Membership by the Chairman, Mr. W. N. Giles.

REPORT OF COMMITTEE ON MEMBERSHIP

W. N. GILES

For seventy-five years the State Agricultural Society has stood for improved agriculture. It has always done this, and it has done it largely through the persistent, unremunerated labor of friends of agriculture rather than by the active farmer or agriculturist himself.

At a recent session of the State Dairymen's Association, a risk was taken, the outcome of which fortunately was successful. At that meeting a gentleman, who is known over the entire state for his fearlessness of speech, asked how many were actual cow-milkers, and called for a show of hands. A few timidly responded by showing their hands, and then, gaining inspiration by the example of their neighbors, other hands followed. The majority, we believe, of those attending that convention, which was met to solve the dairyman's problems, were men autually engaged in the business. An apparent majority were cow-milkers, but it is only an estimate, for the gentleman asking the question did not have the temerity to put the negative side to a vote.

As we look at the formidable office list of this society and scan this audience of people interested in and anxious for the promotion of agriculture — honestly, sincerely and enthusiastically so — we are wondering, if such a vote were taken here, whether we dare hope for so successful an outcome. There is no doubt of the earnestness of purpose and the whole-hearted, disinterested effort made by this society for the promotion of agriculture, yet what we want and what we lack is members. The following incident is not related with any degree of criticism of its eminent managers, either of the present or of the past, but to illustrate a thought. In a very severe engagement in one of our wars, a general was becoming severely pressed by the enemy, and in his distress sent his orderly to another general requesting help. The orderly did his errand and shortly returned with the information that he could send two captains and a colonel, to which the general impatiently said, "Go back and tell him we want men, not officers; we have work to do."

This society has excellent leaders and an able corps of speakers and lecturers, whose thoughts are helpful, their suggestions practical and their enthusiasm contagious. With a membership representing the real soil occupants and farm owners, who could go away inspired to do better things, think better thoughts and live better lives, this society of agriculture would bring forth things worthy of the effort expended.

Your Committee on Membership would like to offer some suggestions that would remedy this fault. New York State, with 225,000 farms, should have an assemblage at the annual meetings of the Agricultural Society that would tax the capacity of any building in this great capital. Its officers should conduct a campaign of publicity and education, should circularize the state, and wage a campaign that would reach not only into every county but every township — yes, into every school district. One that would bring to every farmer the fact of, not "How can I afford to go" but "I cannot afford not to go."

Send word to each man that a great shaking of the political plum tree was to be had on a certain occasion, and he would be there with his basket. He might get something valuable, and

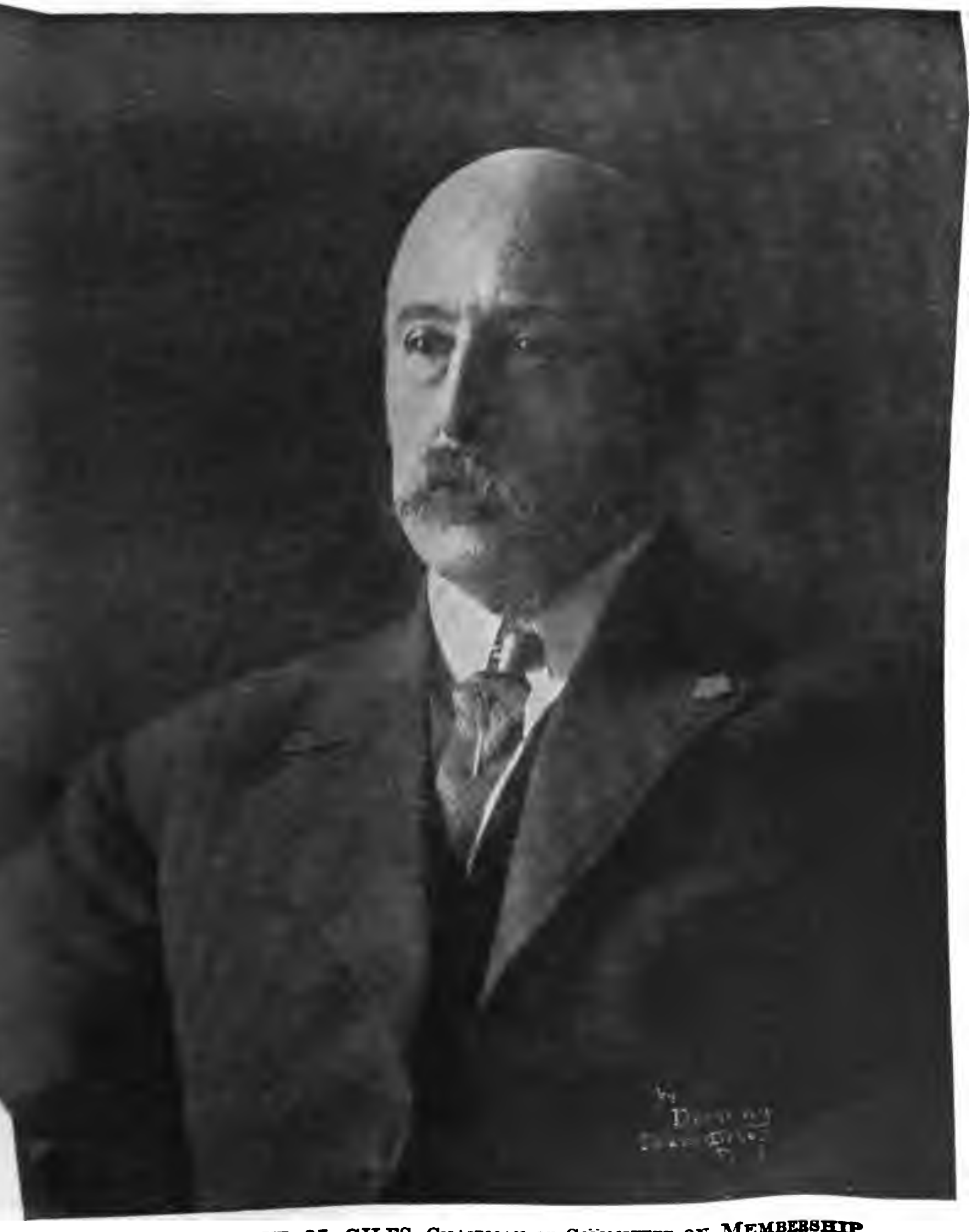

Fig. 477.— W. N. GILES, Chairman of Committee on Membership

he would be there. Yet how much more satisfying and valuable are the things he can take from such a gathering as this. We must reach him, we must show him, we must get him there; and we must have a committee for this purpose. This committee should be sympathetic, enthusiastic, determined. It might be made up of a lawyer, a doctor, a merchant, a railroad man, an editor, and a man of common sense, but whatever their real calling or occupation, they must — like the late Jay Gould, who said in Democratic districts he was a Democrat and in Republican districts a Republican, but in all cases an Erie Railroad man — always be promoting the farmers' interests. This appeal or argument should go forth with such a vigor that the man who needs it most will be here to take his part.

This society has had its " ups and downs." It has been a potent factor and it has almost sunk from sight, but it is back to stay, and it has come back through the persistent and constant efforts of that noble band of life members, who through it all maintained the name and honor of the State Agricultural Society. Let us swell the ranks of these century-old veterans and pledge ourselves that, while death may overtake them, their numbers are being supplied by our names and new blood. May the honored roll of life members never grow less, and the active members grow in such proportions that the attendance and interest of these annual meetings shall be commensurate with the great interests we are here to represent.

At the time the state took over the State Fair in 1899 there were 2,200 members; at the present time we have but 900. Notices were sent out to all these members and replies have been received from 610, which undoubtedly represents the active membership at this time.

I wish to read a telegram that has reached me since coming into this room. It is dated at Syracuse and addressed to myself as Chairman of the Membership Committee:

"W. N. GILES, Chairman, Assembly Parlor, Albany, N. Y.:

"Syracuse sends greetings on this, the Seventy-fifth Anniversary of the organization. Put me down for ten new annual memberships for this year. I shall see that they are secured and the dues paid to the treasurer. Long live the New York State Agricultural Society and its officers. Long live the State Fair and its continued influence and usefulness.

"Cordially yours,
"S. T. BETTS."

THE PRESIDENT: Mr. Giles has given us some food for thought. Has any one else at this time anything to suggest? If not, we will proceed to the next item on the program, which is the report of the Committee on Legislation by Hon. C. Fred Boshart.

REPORT OF COMMITTEE ON LEGISLATION

C. FRED BOSHART

This society from year to year makes but few recommendations for legislation, and of these none seemed more important and far-reaching than that for the creation of a Food and Market Commission. It was the good judgment of the legislature to create this commission, and the people of the state can be congratulated in the selection of the man to organize and perfect the plans of this important work. The idea of cooperating in buying and selling — that is, bringing the consumer and producer in closer relations — has been discussed in our meetings from year to year, and we are now in a position to realize fully the value of this society in working to promote higher agricultural ideals. Our members are principally producers, and it is but natural that our minds are turned towards legislation to encourage better market facilities and more remunerative prices for the commodities they produce. One of the greatest evidences for the necessity of the establishment of the Food and Market Commission is the result of the more recent investigation into the profits of farming by the Department of Agriculture, which revealed the fact that the average farmer gets little or no money reward. It is the tilling of the soil, the cultivation of the plant, that brings to man fruits and vegetables and to animal life sustenance, and we may say that from the soil and what is under the crust of Mother Earth is the beginning of life and the first source of all wealth. The prosperity of our people depends upon our agricultural pursuits. The products of our soils furnish food for the brain and strength to the body, and every northern state of this United States stands as a living example of agricultural prosperity.

According to location, soil and geological formations, many of our great prosperous states are particularly adapted to special lines of agriculture — stock raising, grain producing and fruit growing — being almost unexcelled in special features.

This is not the condition of the state in which it is our privilege to live. New York is a great diversified agricultural state. Its climate and soil conditions are adapted to produce not only special crops, but in one part of the state or the other there is grown nearly all of the staple agricultural products, to a perfection that we find in no other country. In the dairy industry New York ranks first in the Union, and on its thousand hills graze the herds which return to their owners more than one hundred millions of dollars' worth of products annually. Add to the value of our dairy products that of our fruits — in the production of which Western New York is unexcelled anywhere in the world — of the truck garden products consumed in the various cities and villages, together with the various other farm crops produced in this state, and we have a total agricultural production from the lands of the state that will nearly stagger the mind to comprehend. Agriculture being so important a factor, not only in the development but in the continued prosperity of our people, it is but natural that our minds are bent toward legislation for the benefit of the masses. If it is a fact that "the average farmer gets little or no money reward for the intelligence and skill with which he has managed his affairs, or the risk and responsibility he has assumed," it is an opportune time that the best efforts of this state be used to find out where the profit goes that naturally belongs to the farmer, for it is the tiller of the soil and his family who labor long hours for the privilege of an existence.

Should this Food and Market Commission, in providing a medium of cooperation between producer and consumer, cut the middleman's profits and reduce the cost of distribution, giving to the farmers the value they should receive and the commodities to the consumer at a satisfactory price, no monetary consideration should prevent this class of legislation.

There is one embarrassment in the administration of this work: the Food and Market Department and the Cooperative Bureau of the Department of Agriculture in this state should be under one and the same head. There should be no division of responsibility if we are to obtain the full purposes and accomplishments of this act. The Cooperative Bureau of the Department of Agriculture in many ways overlaps the work of the Food and Market Commission, and I think this society should recommend legislation consolidating both departments in one, with sufficient funds to organize and effect necessary reforms. I recommend that a committee consisting of the Commissioner of Agriculture, the Commissioner of Foods and Markets, with three or four other members, be appointed by the president of this society to work out a plan for the unification of the Cooperative Bureau with the Department of Foods and Markets and report later to this convention, in order to frame a recommendation to the legislature.

During the last year we have adopted a cooperative system for financing the mortgage credits for the homes and farms of the state. The principal instrument of this system is the Land Bank of the state of New York. It is the first institution of the kind in the United States. The bank has just been organized. The men in charge of this important institution may find that the law needs some amendments, but it has never asked or received any financial assurance from the state. It is purely a cooperative enterprise and is attracting the attention of enthusiastic men in all parts of the country.

Outside of our dairy industry, the most important agricultural pursuit followed by our people is fruit growing. That branch of fruit growing relating to the packing and marketing of apples is one deserving of considerable attention. Glancing around the great commercial centers we find the markets stocked and filled with fruit — not better in quality than New York State apples but more attractive for sale. A bushel box of this western fruit will command a price nearly equal to the price of two barrels of New York State apples. The state grower will acknowledge the quality of no apple superior to his and at the same time many are obliged to take an inferior price for their production.

A person who has had the privilege of going through the citrus growing sections of Florida and California could not but be impressed by the systematic methods employed for the grading and packing of their fruit. We find there is individual packing and association packing. Each box of fruit is carefully graded as to size, and is marked according to the number of fruit in the box and the price per box, the latter corresponding to the size of the fruit. On every box we find the brand of the packer, whether private or association packed.

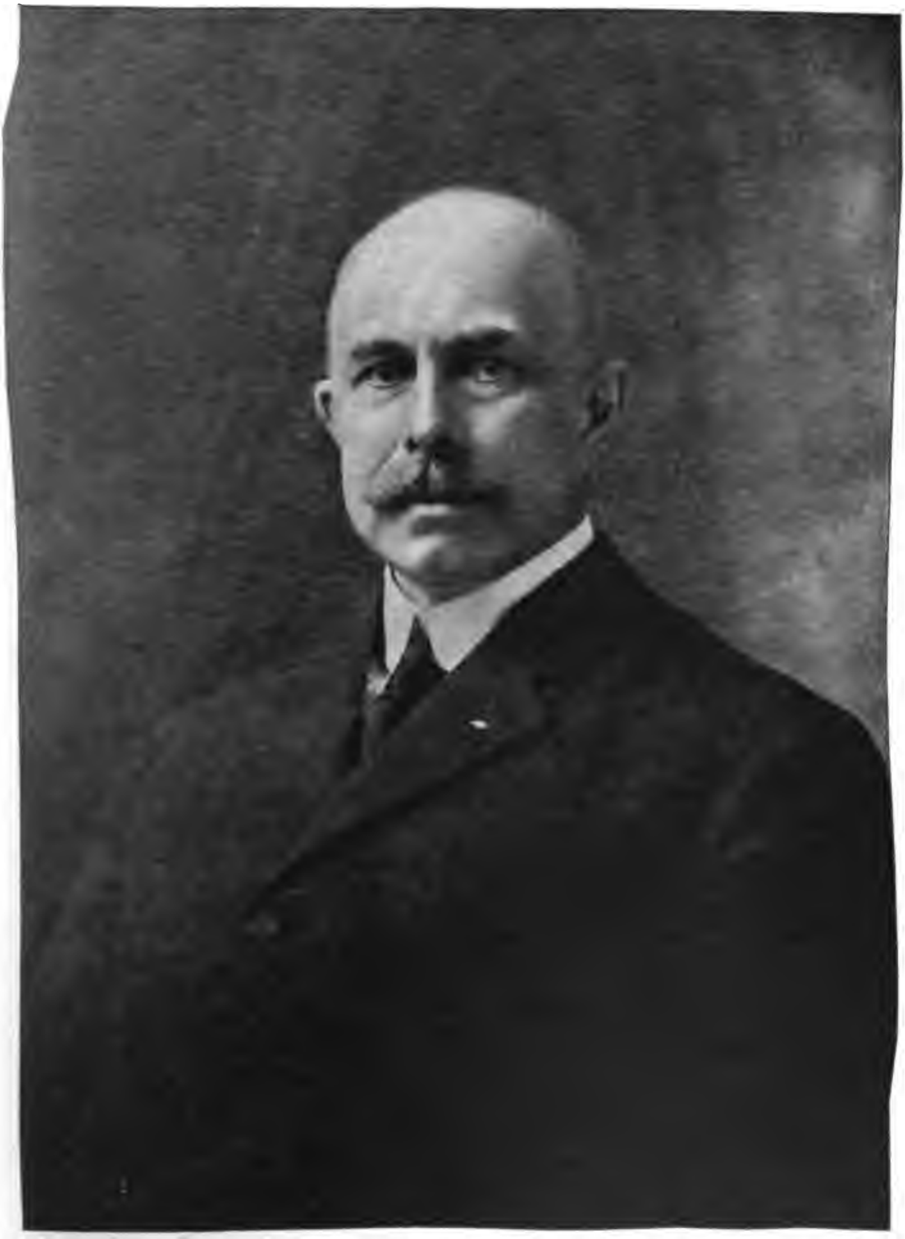

Fig. 478.— C. FRED BOSHART, Chairman of Committee on Legislation

To restore the former prestige of the New York State apples, we should have an honest pack of the fruit, and this committee of your society could make no better recommendation than that of adding a new section to the Agricultural Law providing a state brand for all packages of apples sold as No. 1 grade, and requiring state inspection at the time of packing. The person having a permit to use the state brand should be held strictly accountable to the state for the grade of apples in the package, whether barrel or box. Undoubtedly it will take some years to firmly establish a New York State brand of apples, but when once established the apple will become as famous as the New York State full cream cheese.

The milk situation has not changed since our last meeting and I could do no better than reiterate here the report of the legislative committee at that meeting, but on account of the pressure of time will refer you for the same to the report of this society for 1914.

There is a section of the agricultural law that relates to the bonding of companies engaged in the business of shipping milk and cream. This section of the law does not adequately protect the farmer from loss when a company fails to meet its obligations. Therefore this committee recommends that the present statute relating to the bonding of milk shipping companies be so modified and strengthened that the farmer will be amply protected from loss when such a company becomes insolvent and fails to meet its monthly dividend.

During the past year there were several creameries or milk shipping stations in this state through which the patrons lost large sums of money, and this is only a recurrence of what has happened many times before. There is no business that is run on such poor principles as the milk business. The farmers daily deposit their milk — the only revenue from their farms — with such companies and do not possess a scrap of paper that would indicate that the milk shipping companies owed them a dollar.

We also suggest that a law be enacted, or the present law relating to weights and measures so amended, that the company operating the creamery or milk shipping station shall give a weigh-bill to the farmer each time he delivers the milk, such weigh-bill to bear the name of the company receiving the milk, the name of the person who owns the milk, the date of delivery and the weight of the milk delivered. When we go to the grocery store, meat market or shop everything we purchase is supposed to have the net weight marked on every package or parcel we buy. The law requires the coal dealer to deliver the purchaser of coal a weigh-bill of the coal delivered. Almost everything is taken care of except the farmer. And here we have a condition where the farmer delivers his milk daily to a milk company, and in the case of an insolvent company, he has nothing to show that the milk company owes him a dollar, and no grounds on which to base an action for recovery of milk delivered.

THE PRESIDENT: The meeting is open now for any discussion or remarks on Mr. Boshart's report.

MR. SCHRIVER: It seems to me we ought to take some action on this report and others as they pass in. It is certainly worthy of our endorsement. That is the only way we can get any voice in the matter — by endorsing it. I think the points are well taken and especially the milk feature, which is very important and needs prompt attention. I move that we adopt the paper as read by the chairman of the committee.

THE PRESIDENT: Any remarks on the motion?

Motion carried.

MR. BOSHART: I overlooked one thing. I made one recommendation which, with the consent of the members present, I should like to reduce to the form of a resolution. I move the adoption as a resolution, that a committee consisting of the Commissioner of Agriculture, the Commissioner of Foods and Markets and three or four others be appointed by the president of this society to work out a plan for the unification of the Cooperative Bureau of the Department of Agriculture and the Department of Foods and Markets, to report later to the convention in order that a resolution to the legislature may be framed.

Motion carried.

THE PRESIDENT: Is there anything further to be offered on the subject of Mr. Boshart's paper. Hearing nothing, we will proceed to the consideration of the question of the County Farm Bureaus. Mr. M. C. Burritt, Director of the work, will give us a brief outline of the Farm Bureau plans and work.

THE RELATION OF FARM BUREAUS TO COOPERATIVE BUYING AND SELLING

M. C. BURRITT

Since there are five or six others to speak on this subject, I shall try to be as brief as possible. I want to say at the beginning that it is not our object at this time to tell in any complete way the work of the Farm Bureaus, and what we may say about the other work of the bureaus will be said in order to give a setting to the particular phase we are interested in this morning, namely, the purchasing and marketing side. I think we ought to keep in our minds very clearly that the Farm Bureaus are preeminently educational institutions — almost exclusively educational institutions. But I think we should also recognize very clearly that this applies not only to the matter of the production of crops but to the marketing of crops, and to any other important phase of agriculture that has a bearing upon the profitableness of farming. Nowhere is education and assistance more sorely needed than along the lines of cooperation in the purchasing of farm supplies and in the marketing of farm products, not to mention the distribution of these products. No feature of Farm Bureau work is more important than this.

This relationship was thoroughly discussed at the recent conference of State Directors of Farm Bureau Work held in Chicago. The consensus of opinion there is expressed in the summary report from the Department of Agriculture, which follows:

" Recognizing the work of the county agent as educational in its nature, he should not take any active part in the transaction of commercial operations, either in purchasing or selling. He may secure information as to markets and marketing facilities and as to sources of supply, and may be the medium in the community through which this information reaches the farmers of his county. In this work the agent should deal with groups, and the actual transactions should be done by the farmers themselves through their own organization by representatives appointed for this purpose. That agent does most for his people who teaches them how to do for themselves. All alliance with firms, institutions or individuals for any purpose other than educational should be strictly avoided. And these alliances should only be made in those cases and under such conditions as shall be free from suspicion as to motives involved."

FUNCTIONS OF FARM BUREAUS

Before we can gain a clear understanding of the relation of Farm Bureaus to cooperative associations, we must have a clear idea of the functions of the Farm Bureaus. These I can best illustrate by means of the two charts which follow.

CHART I

THE WORK OF A COUNTY FARM BUREAU ASSOCIATION

Preliminary Program
to introduce Farm Bureau Work through the
Farm Bureau Manager

Through personal requests
The Farm

- Farm Management.
- Farm Organization.
- The Use of Lime.
- Fertilizer Tests.
- Establishment of Alfalfa.
- Seed Treatment and Testing.
- Orchard Renovation.
- Balancing Rations.
- Poultry Improvement.
- Drainage Needs and Methods, etc.

Through local committeemen
The Community and County

- Cooperation with granges and other local and county-wide organizations.
- Field Demonstrations.
- Farmers' Institutes.
- Extension Schools.
- Schoolhouse Meetings.
- Farmers' Exchanges.
- Boys and Girls Clubs.
- Study of statistics, care, observation, and orderly arrangement of this material.

CHART II

THE WORK OF A COUNTY FARM BUREAU ASSOCIATION

Permanent Program
through the
Manager of Farm Bureau
by means of a system of projects — A, B, C, D and E.

Primary Problem

1. ***Increasing the profitableness of farming.***
   - A. (State-wide.) Farm Management Survey or Farm Business Anaylsis.
   - B. (Regional.) Attack on Problems of Distribution and Purchase of Supplies.
   - C. (Regional or local.) Development, Standardization and Advertising of Leading Products.

Secondary Problems.

1. ***Improvement of Home and Country Life.***
   - D. (Local.) Boys and Girls Club Work in Cooperation with District Superintendents.
2. *Organization of Agricultural Improvement on a Self-Help Basis.*
   - E. (Local.) Development of Local Organized Agricultural Effort — The Farm Bureau Association.

I have divided the work of the Farm Bureau Association and its manager into two parts — a preliminary and a permanent program. The preliminary program may occupy anywhere from one to three years, according to how well the movement is organized, how much the people of the county are interested in it, and the personality of the bureau officers and manager. After all the work outlined in the preliminary program has been accomplished, only a beginning has been made. The field has been explored, the problems outlined and the soil made ready for cultivation.

The permanent program of the Farm Bureau is the really important thing. In a few words, this is to increase the profitableness of farming. Upon this preliminary problem all other problems depend. It is not that the secondary matters are less important in themselves, but that it is not the primary function of the Farm Bureau to work upon those problems.

It will be noted that we have outlined three ways in which a Farm Bureau can help to increase the profitableness of farming. The first of these is a business analysis, which shows strong and weak points, and opens the way to the proper work upon them. The secondary, and the one in which you are primarly interested here today, is that of saving money to farmers by the cheaper purchase of farm supplies, and by such work upon the problem of distribution and marketing as will save expenses here also. You are interested, too, in the third way of increasing profits, which is to increase the selling price by developing better quality in the product, standardizing it and advertising it cooperatively.

This program is not a theory but a fact, and much work has been done along these lines.

In a small way the Farm Bureau men have begun with what we call farmers' exchanges. There are ten of these exchanges now in operation in the counties of Allegany, Broome, Cayuga, Chautaqua, Chemung, Delaware, Jefferson, Montgomery, Otsego and Tompkins. These exchanges amount practically to cooperative advertising of small farm articles or products and of live stock. The farm bureau manager simply prepares a list of the things the members of the bureau have to sell and of the things they want to buy. This list is circulated, and thus seller and buyer are brought together at a minimum of cost in middlemen. These little exchanges, most of which have been operating for less than six months, did $3,500 worth of business last year at little or no expense. Four hundred eighty-seven farmers were supplied with labor on their farms; eight farms were rented through the medium of these exchanges.

Citing one or two examples. The first issue of the sales and exchange list in Otsego County went to seven hundred farmers. In it there were listed more than $20,000 worth of live stock. It made the sale of a Guernsey bull calf within four days. The following is from Manager Merchant's report for September 5th for Montgomery County.

> Over $30,000 of real estate and personal property is listed in the first issue. Some supplies are also wanted for purchase. This service is free to all members of the Farm Bureau Association, and a copy of the exchange list is mailed to each member the first week of every month. It is an effective means of bringing buyer and seller together within the county and keeping business at home.

The Farm Bureaus have also been concerned in larger cooperative buying and selling enterprises. In the majority of cases, these enterprises were already organized in the county or they were organized by outside agencies, with the assistance of the Farm Bureau men. The policy of the Farm Bureaus has been a conservative one on this matter of cooperation. As I have already said, we believe in the slow growth. True cooperation originates with the cooperators and not with the stimulators of cooperation. It should not be worked up from outside but should spring up spontaneously and because of a real need in the community. When the community is ready enough for cooperation to ask for help to bring it about, we think the Farm Bureaus can perform their greatest service by helping to direct cooperation along proper lines.

Associations have also been assisted in these larger enterprises in New York State during the past year. The Farm Bureau Managers who follow me will give you illustrations of this work. These examples should suffice to show that Farm Bureaus are vitally interested in cooperative buying and selling associations, and that the program of work which I have outlined to you is not a paper scheme, but a real plan in operation.

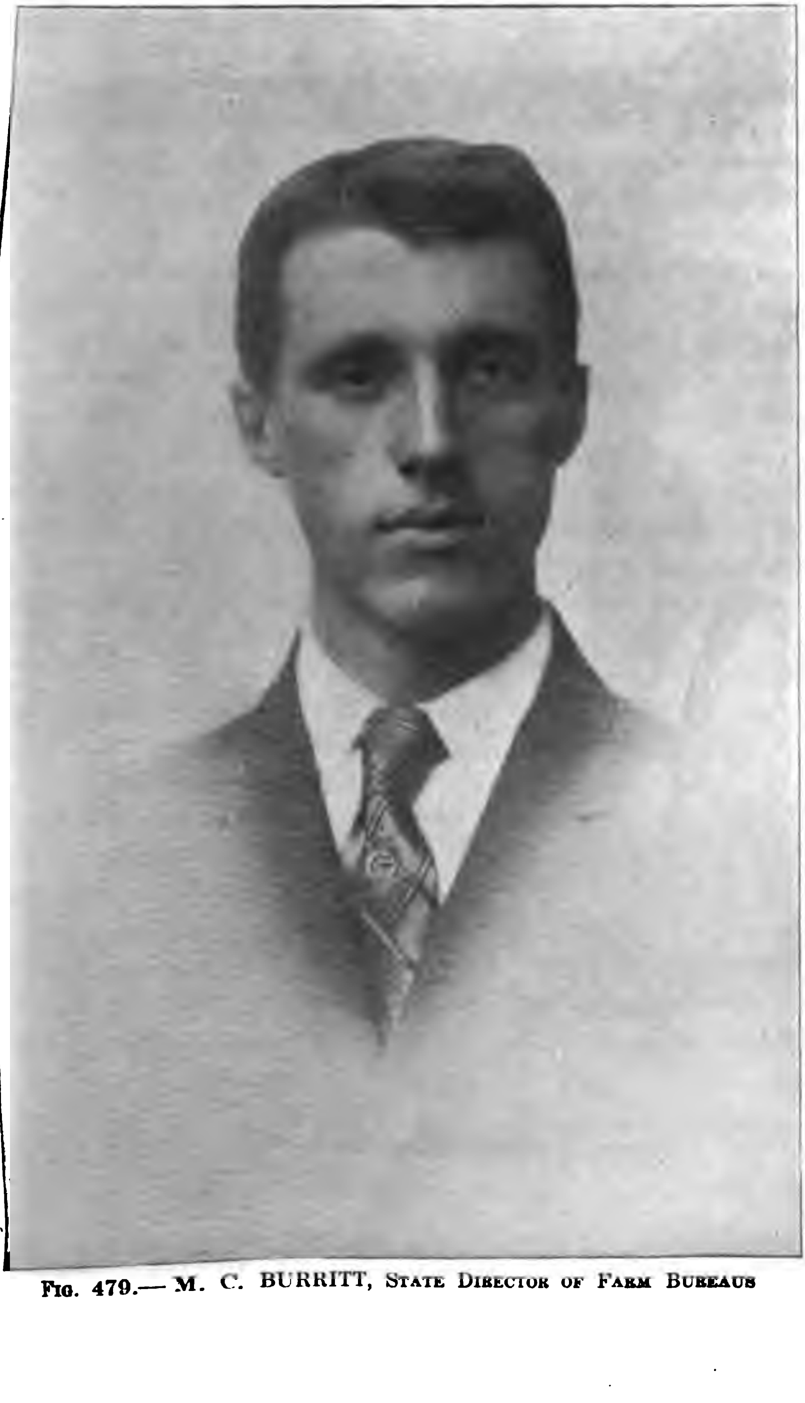

FIG. 479.— M. C. BURRITT, STATE DIRECTOR OF FARM BUREAUS

DIFFICULTIES IN THE WAY

None recognize more clearly than the Farm Bureaus that this program is certain to arouse opposition on the part of that small class of citizens who perform more or less service in getting farm products and supplies from producer to consumer. We are not among those who would shake a red flag in the bull's face. Not that we fear the bull, but we believe that the gentleman can be handled in a much more satisfactory manner to both parties concerned, by other methods.

It seems to us that the first question to be settled is whether or not the middleman, be he a local dealer or a commercial man in a distant city, performs a real service. Some middlemen are necessary. All middlemen can be divided into two classes — useful and useless. In ignoring and dispensing entirely with the services of the useless middlemen, we shall not arouse very much disturbance. The man who does not perform a real service in his community is not very strong there and will not be able to raise very much of a row.

When we have determined that a middleman really performs some service; that he is in a measure necessary in the conduct of the business — then we should not fight him or ignore him, but try to cooperate with him. He is usually well established in the community and has all the tools for service at his disposal. By cooperating with him, we can secure advantages to ourselves and assist him in his legitimate functions, with the probable result of decreasing the charge which he is obliged to make for his services, at the same time increasing his total profits by a larger trade.

As an example of what I mean, let me call attention to the way this matter has been handled in Otsego County, quoting from Farm Bureau Manager Barlow's own report.

> Orders have been placed for 348 tons of 16-per cent. acid phosphate at a total saving of $1,444 over a time price, December 15 payment. Orders are now being taken for four additional cars. All orders have been taken by Farm Bureau committeemen and placed in the hands of a local dealer whenever it could be so arranged,— that is, whenever the local dealer had foresight and plenty of good sense — who took the money and unloaded the goods for which he received fifty cents per ton, a price agreed upon by dealers themselves.

In summarizing, let me emphasize again that the primary function of the Farm Bureau is educational and that an important part of education in agriculture at the present time is the furnishing of information, suggestion and direction about cooperative farm purchasing and marketing; the development and standardization of crops, especially for quality, but also for quantity in a given region; and cooperative advertising. It is the aim of the Farm Bureaus always to act in the interests of all the farmers in the county. The Farm Bureau is itself a cooperative enterprise, not only among the farmers of the county, but among the institutions and governments supporting the bureau. Hence it is consistent on our part to educate, lead and assist wherever we can in cooperative buying and selling enterprises. This is all the more important because such enterprises are at the present time one of the important limiting factors in the profitableness of farming.

COOPERATIVE EFFORTS OF THE DELAWARE COUNTY FARM BUREAU

T. M. Avery

Cooperation, as it has been defined, is the working together for any desirable end. It is profitable to the farmer for it enables him to purchase his farm supplies at wholesale, and, affiliated with several men, he is able to do this much more economically. This applies not only to the purchasing end but also to the marketing part of cooperation. Cooperation would tend to make better farms and better farmers, therefore making country life more attractive; and it would have a tendency to keep our boys and girls on the farms. Cooperation by farmers would make it necessary for them to keep accounts and to study and plan their farming, thus putting it on a business basis, and therefore employing better managerial ability. This would increase their income from the farm.

The lack of cooperation on the part of the farmer at the present time, as I see it, and as my experience has been, is that he has not the ready cash to enter into the buying of supplies on a large or even a small scale. The problem of cooperation should be in helping these men so that they can take advantage of the cash saving, and to do this we must begin with his methods of farming. It is also necessary to increase the business ability of the farmer so that he will have more confidence in his neighbors and in himself.

In Delaware County, through the efforts of the Farm Bureau, the price on lime was decreased. Farmers in many communities cooperated and purchased a carload of lime at a time, repeating this at regular intervals until each one had all the lime he needed. In some localities this has not been done chiefly through the inability of some farmers to look after the business end. However, through this method of cooperation several thousand tons of lime will be used this season.

The experience of the farmers in regard to feed has brought out the fact that it is almost impossible to purchase feeds direct from the manufacturer without paying the usual commission to the local dealer.

On the other hand, the cooperation of farmers to sell farm products will be slow on account of the lack of confidence in the so-called cooperative societies. From our experience it seems that some of the societies are in no condition to accept this kind of selling, due to their lack of knowledge as to where to dispose of the produce. The other chief obstacle in the selling of farm products direct, which lies in the hands of the producer, is the unattractive and unsatisfactory appearance of the product when it reaches the market. The following incident illustrates this condition.

An attempt was made to sell a carload of potatoes. The people receiving these potatoes claimed that they were not properly graded and sacked, and of course they were sold at a loss. The society receiving these potatoes apparently made no attempt to obtain a market until their arrival, and seemed to be in no position to carry on work of this kind. Taking this attempt as an illustration, it was not a very satisfactory method of cooperation. However, we find from this that the old Yankee trick of "putting the large apples at the top and the bottom of the barrel and the small ones at the middle" can no longer be practiced. Now they must all be of the same size.

Briefly, to encourage cooperation on the part of the farmer is to help him in such a way that he may have the ready cash to work with, and also instruct him in the proper way to put up his produce. On the other hand, those receiving his products must have a better knowledge of what is wanted, when it is wanted, and how much is wanted, and not wait until the produce has arrived before finding a market.

This condition of the improper grading of produce will be eliminated by the farmers in certain localities in Delaware county by using an icehouse as a storage for farm produce. One man will be employed to grade the product and have it in readiness to ship at any time, thus insuring uniformity in distribution and grading. The farmer will deliver his produce to the storage house, and, if the market is low, will be able to receive seventy-five per cent. of the market value of the product from the bank, so that he will have money to work with; and when the price advances the product will be sold. After paying the loan at the bank and his warehouse fee, the farmer will have the increase from the market price. Through this method, it will be much easier to sell farm produce.

COOPERATION IN THE CLINTON COUNTY FARM BUREAU

C. B. TILLSON

Your President has suggested that I briefly state what we have accomplished in the way of cooperation in Clinton county. It is true that we have done more or less cooperative work in the way of purchasing feeds and fertilizers, but I feel as though our greatest achievement along this line has been in inducing farmers to organize for the purpose of growing and marketing seed potatoes.

I wish to outline in a very few minutes just why we felt the need of this cooperative movement. After I had been in Clinton county long enough to learn conditions I could see that potatoes was one of our best cash crops. The quality of the stock that we were producing was excellent. After considering the matter thoroughly I thought we should put our energies to the producing and marketing of seed potatoes. Naturally, the first step in anything of this sort is to reach out and see if there is a prospective market. Upon taking up the matter with a few Farm Bureau men located in potato sections along the coast, I found that there would be no difficulty in disposing of seed stock providing it was of the right quality. Being assured of this fact, our next step was to produce the right kind of potatoes free from disease and true to type.

Our first sales were made in the fall and winter of 1913. Although the sales for that season only amounted to something like six thousand bushels, it opened up a market that promises well.

We were successful in getting large potato growers located in the potato section along the coast to visit this section and inspect the potatoes as they were being dug. This was our first step in marketing. After the first trial order of two cars had reached its destination we began to receive more inquiries for potatoes of the same quality. It was at this time that we began to feel the need of cooperation of some sort. Thus far, we had had no team work whatever. It had been done by individuals working along their respective lines.

When we began to get orders for several carloads, it was clearly evident that we would have to have someone to look after the business, name prices, and attend to the shipping. So it was in the winter of 1913–14 that we organized our Seed Potato Growers' Association.

At the time the association was organized no attempt was made to have a large membership. In fact, we were not desirous of having a large membership. The part that we were interested in was to have members who realized the importance of producing first-class potatoes true to type and free from disease.

Our constitution and by-laws are as simple as we could make them and have them effective. We have a board of directors and a secretary-treasurer who is really the manager. The board of directors gave the secretary-treasurer power to transact business for the association subject to its approval.

After we had formed the association we then had something definite on which to build future plans. The first step was to inspect the seed potatoes that were to be planted in the spring of 1914. This inspection had to do with the type and freedom from disease. We were anxious to have the type that the different members were growing uniform, so that if eight or ten different farmers should load one car the tubers would look as though they all came from the same field. This, of course, meant that we should have a competent, disinterested person do the inspection work. Each member of the association before he planted his potatoes was quite familiar with the type desired. I am glad to be able to report that the type of potatoes produced in the fall of 1914 was far more uniform than anything we had previously produced. During the growing season the fields of the members of the association were visited by a disinterested party and inspected. This inspection had to do with freedom from disease and trueness to type.

Before the potatoes were harvested in the fall the weak or otherwise inferior hills were discarded. Then, at the time of digging, the hills that were not up to the standard either in type or other respects, were also removed. This gave us a very high quality of potatoes to put upon the market.

Quality has been foremost all the time. The association has not tried to advance the price beyond what was reasonable. We have felt that there is a class of growers who are willing to buy the seed we are producing, and pay us for the pains we are taking, just as soon as they are able to find it.

What has been accomplished in Clinton county in the way of organizing to produce a crop of high quality, can easily be done in other counties that produce other crops. It is my belief that scarcely a county exists that does not have one crop it could well specialize on and make a united effort to improve its quality and market conditions. As I see it, the great danger in cooperation is for groups of farmers to organize before they have some cooperative work to do. In our own work in Clinton county we did not think of organizing until we had some definite piece of work mapped out for the organization.

Although there are many defects in the organization that we have perfected, I feel as though it is a start in the right direction. From the orders that we have received this year and are receiving constantly, I am confident that it should grow stronger and stronger with each season's work.

COOPERATION IN SELLING LIVE STOCK

H. E. BABCOCK

My experience in cooperative selling has been practically confined to pure-bred live stock, and even then the proposition is more of an advertising one than an actual selling one. In Tompkins county the work of advertising pure-bred live stock, in order to create a market for it, has been carried on by the Tompkins County Breeders' Association working in cooperation with the Farm Bureau Manager. The best statement of the history and aims of this association follows:

"The Tompkins County Breeders' Association was formed during the spring of 1911, with eighty-two charter members, and was the direct outgrowth of a talk on 'Community Breeding' given by Professor E. S. Savage of the Department of Animal Husbandry at Cornell University, before a farmers' meeting at Waterburg, N. Y., during the winter of 1910–1911. The growth of the association has been steady and healthy up to the present time, when there are about two hundred members.

"The object of the association is 'to promote the breeding and improvement of high-grade and pure-bred live stock in Tompkins County, and to aid its members in buying, breeding and selling first-class animals.'

"The Tompkins County Breeders' Journal, a little magazine devoted to the interests of better farming is published monthly by the association, and has a circulation of about 800 copies. An up-to-date list of pure-bred animals for sale by members of the association is printed in it each month. This publication is sent to subscribers for twenty-five cents per year.

"The Tompkins County Breeders' Association has secured a Farm Bureau for Tompkins county. In return for the support rendered the Farm Bureau by the Breeders' Association, the Farm Bureau Manager acts as editor of the Breeders' Journal and oversees the sales department of the association."

From the above statements you will see that the association embraces breeders of all kinds of live stock and that a large part of its work is educational rather than commercial. Mr. Tillson pointed out to you how it was necessary to standardize county seed potatoes before there was a market for them. It has been just as necessary to standardize Tompkins county pure-bred live stock as it was Clinton county seed potatoes, only the process has been a longer one and infinitely more difficult.

In fact, during the first few years of the association's life, practically no stock was sold. As a result of the cooperative advertising that is done through the Breeders' Journal and the National Agricultural papers, last year such business ranged from $8,000 to $10,000, not including the animals sold at the first annual consignment sale.

There were two reasons why this business could be done. In the first place, the period of education and standardization had been gone through; second, through the cooperation of the Breeders' Association with the Tompkins County Farm Bureau, the partial service of a man whose time and energies were paid to work for the farmers of the county, were secured, and this meant that more efficient work would be done. It goes back to a fundamental principle in all cooperative work, namely, that where real service is rendered there must be adequate remuneration.

The present status of the association is better than ever before. It ended the year with $1,100 in the treasury, with the full equipment for carrying on its work, and with a reputation and good will established through four years of patient and honest dealings, that cannot help but be invaluable to its members in the years to come.

RESULTS OF COOPERATION IN THE OTSEGO COUNTY FARM BUREAU

Floyd S. Barlow

After holding a series of "get acquainted meetings" throughout the county, upon my arrival last winter, I was able to plan a campaign for soil and crop improvement. This included the use of lime, acid phosphate, legumes and stable manure.

Since from $3.80 to $6 per ton was being paid for ground limestone and the need of it was imperative, we turned our attention in that direction. With the help of Assistant State Director H. E. Babcock, we induced the A. L. Norton Stone Company of Cobleskill to deliver in car lots directly to farmers, for $1.65 per ton, at the mill. The delivered price at Sewards, the nearest station in our county to Cobleskill, is $2.05, and at Unadilla and Cooperstown, the furthest points, $2.25.

The Otsego & Herkimer Railroad, which traverses the central part of the county, was prevailed upon to install a lime grinder at their quarry near Richfield Springs, and they are now delivering at any farm along the line with side dump cars, or at the stations in box cars, at $2.25 to $2.40 per ton.

The Norton Stone Company began delivering at this price about the first of May, and the trolley company on October first. On January first there had been reported to us the sale of 1,081 tons of the limestone, at an approximate saving of $2,000.

When lime and phosphate are used we can successfully grow clover and winter vetch, and in some sections of the county alfalfa.

In almost every instance marked results were secured when the seed was inoculated. We are endeavoring to get our men in the habit of digging up leguminous plants to see if the nodules are there; and if not, learn why not, and see that they get there.

We plan to do some cooperative work next year along the line of buying seeds — to get quality, to see that it is northern grown, and to obtain a price that will encourage the paying of cash. In all probability the business will be done through our local dealers. We are of the opinion that these men are a necessity, and if we can work with them to our mutual benefit, more will be done for the community than could be if an attempt were made at elimination.

Cooperative work which bids fair to accomplish much has been launched by the organization of a Holstein and a Guernsey club, which embrace the county. Both have adopted schemes of advertising. The Holstein club now represents over 2,000 cattle, three-fifths of which are registered.

While the work we are doing with stable manure has no bearing on cooperation, it is one of the important phases of our plan for soil and crop improvement. There are, of course, exceptions to all rules, but our general recommendation is that manure shall be applied as a top dressing to meadows in six — or eight-load quantities. We still have many men using fifteen to twenty loads per acre, and plowing it under for corn.

The time price for acid phosphate, first payment December, was $1 per unit.

We have sixty-seven Farm Bureau committeemen. They have been working with me at our general meetings to pool orders for car lots of this phosphate. The committeemen in the town of Edmeston called a meeting and conducted it without my assistance, at which orders were secured for fifty tons of phosphate and 140 tons of burned lime.

Our plan has been to put the business in the hands of a local dealer or fertilizer agent. A date was set at which time the money was to be in the hands of the agent, after which he notified me of the number of tons wanted and the bank on which draft should be drawn. Those who failed to pay were simply forgotten.

The delivery price was $11.85 per ton, 50 per cent. of which went to the man who handled the goods. The plan seems to have worked well. There were 348 tons delivered by December first at a saving of $1,444, and orders are now being taken for nine cars, which will bring the total tonage well over 500.

A little figuring showed the men that they could borrow money for nine months at 6 per cent., so they could pay cash and save 29 per cent. on the money by not buying at a time price.

The Guernsey club has plans under way for the purchase of a carload of bred females.

Arrangements have been made for the organization of a Jersey Club and a Sheep Breeders' Association. We are insisting that definite undertakings be begun at the outset, and that each member contribute his share of time and thought.

WORK OF THE CORTLAND COUNTY FARM BUREAU

E. H. Forristall

The Cortland County Farm Bureau was organized in January, 1913, with a committee of seven men. The present manager was secured, and reported for duty February 24, following. There was no paid membership and no one in the several towns to whom to look for cooperation. But thanks to the grange people we were given a welcome, and succeeded in making quite a satisfactory preliminary survey of the county as a whole. A farm survey of the township of Homer gave definite data for the outline of our projects.

The production of hay by the use of lime at the time of seeding, also the top dressing of meadows with chemicals, has proved very practical and remunerative. In the town of Solon an application of 800 pounds of Solvay hydrated lime per acre on hill land, at the time of seeding down with oats as a nurse crop, gave the following year a net increase of 4,229 pounds of cured hay per acre. Incidentally, through our influence directly and indirectly, there were purchased by the farmers of Cortland county 3,000 tons of lime in 1914. An application of chemicals — nitrate of soda, acid phosphate and potash, costing $6.44 per acre — gave an average net increase of 4,092 pounds cured hay per acre. Seventy-eight farmers of Cortland county cooperated in the use of twenty carloads of chemicals in 1914, as against one carload in 1913.

We have held demonstrations in pruning and spraying apple trees, assisted by the Department of Pomology of the New York State College. Through our efforts, directly and otherwise, over 10,000 apple trees were sprayed in 1914.

The farm survey of Homer showed that less than 10 per cent. of the sales of farm produce came from cash crops. One project was to increase the labor income by increasing such sales. Because of our natural potato soil, high elevation, cool climate and heavy average rainfall, the potato crop was selected. A Potato Growers' Association was organized in 1914 with twenty-three members. The membership has lately been increased to thirty. The members pledged themselves to grow potatoes true to name and free from disease; and to grade to a standard and stand for inspection from planting of seed to shipment of potatoes. A great deal of data has been collected and put in form for the members. Several are practicing hill selection and carrying on the tuber unit experiments.

We have not forgotten the farm home. Eleven canning clubs in as many districts have been organized; also a poultry club, pig club, potato club, corn club and garden clubs, all among the boys and girls of the county. The members of the canning clubs comprise both women and girls. We have had the hearty cooperation of the Home Economics Department and the Department of Vegetable Gardening of the New York State College.

Statistics of office and other work in 1914: We have received 2,100 telephone calls at the office; 1,400 business calls, and have written 3,735 letters. Twenty-seven circular letters, 3,500 copies, have been mailed out. We have addressed eighty-six meetings, with a total attendance of 5,949, and have visited 467 farms.

One Farmers' Week was held in March and a Farmers' Week and Agricultural Carnival in November.

We have endeavored to work with groups of people rather than with individuals, and to encourage people to help themselves.

THE PRESIDENT: This subject of Farm Bureaus is open for a brief discussion if anyone has anything to add to the illuminating discussion we have heard. If not, we have a report of the Committee on Marketing and Transportation, which really should have come before the Farm Bureau speakers. This report is to be made by Mr. Ezra A. Tuttle.

REPORT OF COMMITTEE ON MARKETING AND TRANSPORTATION

EZRA A. TUTTLE

For several years past reports have been made to this society by the Committee on Marketing and Transportation, and recommendations have been made for a better system of marketing farm produce in the cities and towns of this state, and principally in the city of New York. The subject is one that has enlisted the active interest of this society, and the discussion of the subject has been earnest and useful. We have set in motion, directly or indirectly, certain agencies and activities to help in the solution of the problem. Numerous conferences have been held to discuss the general subject of food distribution.

The State of New York created by law a commission to investigate the subject of the cost of food production, transportation and distribution. That commission did valuable work and made a valuable report. Conferences have been held on the subject of cooperation, the formation of local cooperative societies and of a central cooperative society. A law has been passed creating the Bureau of Cooperative Organization, and work has been done throughout the state to assist in the formation of cooperative societies for both buying and selling. The State Grange is committed to the idea of cooperative organizations among producers and to a better system of marketing than now exists. Much time and thought has been given to devising a general plan for food distribution, especially in the City of New York, which is the great market for the farm produce of the State of New York, as well as for other sections. This plan has been fairly digested, has been criticised from every angle, and a conclusion has been reached by the process of elimination of the things that were not feasible and by an examination of existing conditions. A constructive plan for a scientific, economic system of food distribution which would answer the requirements of the whole city of New York, and which is applicable to all the towns and cities of the state, has been elaborated.

The Department of Foods and Markets, created by law last spring, is fortunate in having as its commissioner the president of this society. His appointment is a marked example of the place seeking the man and not the man seeking the place. It is absolutely nonpolitical, and the organization and operation of this department will be strictly on business-like principles with the sole purpose of serving to the very best possible advantage, the producers of the state and the consumers in the cities and towns of this state.

This department asks for and hopes to receive the hearty cooperation of every department and of all the people of this state, of the grange as the oldest and largest farmers' organization, and of all cooperative societies and farmers' organizations. It is only with this cooperation that the department will be able to proceed in bringing about the benefits which it sees so clearly are within the reach of producers and consumers in this state.

The general plan for the organization and operation of the department in the city of New York is substantially as follows, but may be modified in details:

Everyone agrees that the cost of living is too high, and all producers agree that the rewards for labor and expense of production are too low. Even a superficial study of the problem will convince anyone that the trouble lies somewhere between the producer and the consumer. There are too many middlemen, too many speculators, too many handlers, too many cartages, too many retailers, too many deliveries, too much waste. Conditions in New York City are not the result of intelligent planning, but are the result of no planning. Ninety per cent. of all the foodstuffs for the whole metropolitan district is received on the lower west side of Manhattan Island below Fourteenth street. This necessarily produces great congestion, great delay in distribution, long hauls to all other sections, often transshipment, exposure to unfavorable weather conditions, deterioration in quality, and extra profits and charges every time the stuff changes hands or is stored or moved. An effort is being made now by the city officials to overcome these serious difficulties and bring producers and consumers into direct business relations, but the open markets do not meet the requirements. They, however, have educational value, and this crude beginning may result in the establishment of the necessary permanent receiving terminals, storage warehouses and retail food stores.

Let us analyze the subject and ascertain the causes of failure and the requisites for success. In the first place nearly all the stuff handled in the open markets arrives in the city in the old way, and has been received and handled by the same lot of commission men, jobbers and speculators, and finally is offered for sale in the markets by push-cart men and peddlers. The stuff is often of poor quality, injured by time and exposure, there are no sanitary safeguards, no proper arrangement, grading or classification, no system, no trained experts to put the business on a scientific, economic basis, and no financial foundation. The farmers have been invited to bring in their stuff and sell it direct to the consumers. This sounds fine, but all the stuff raised by the farmers within driving distance of these markets is only a " drop in the bucket " in comparison with the amount required to feed New York.

Then, again, the farmer or gardener is not a trained merchant. He has no business trying to retail his produce. He is a producer and his place is on the farm. He cannot afford to drive all night — ten, fifteen or twenty-five miles — with a load, and spend all the next day trying to sell in twopenny lots from his wagon with no chance to properly arrange, classify and display his goods, and then drive home the next night.

Think of the life! What could the man do who had 50 to 200 barrels of cauliflower that must be cut and sold in a day or

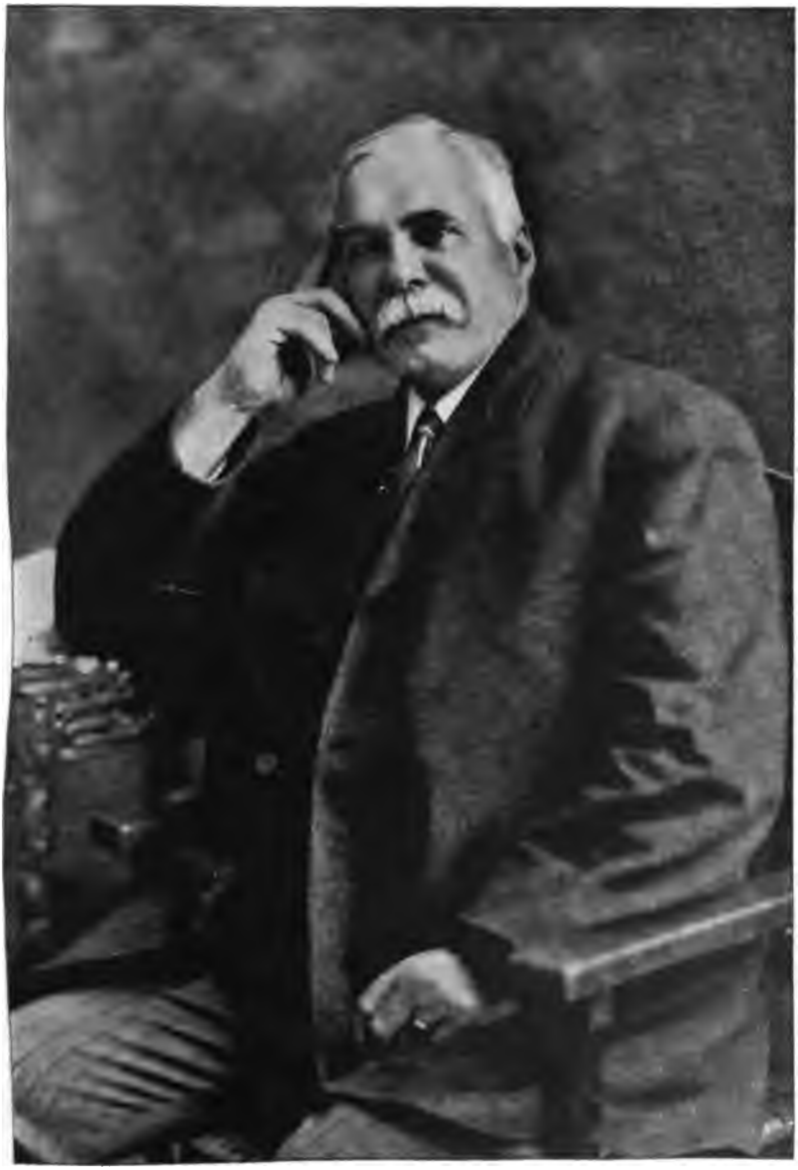

Fig. 480.— EZRA A. TUTTLE, Chairman of Committee on Marketing and Transportation

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two? It will not keep. How about the man with 1,000 barrels of apples or pears, or baskets of peaches or grapes, or 10,000 bushels of potatoes or tons of cabbage, or large quantities of other produce that must be harvested and disposed of without delay? Think of stormy weather, rain and cold and snow; and then think of the open markets. Again, how are the people to be served after the few months of nearby harvest are past? Are we to settle back into the old rut of middlemen, jobbers, wholesalers, speculators, cold storage and high prices to the consumer, and the thirty-five-cent dollar to the producers?

The first requisite of a successful and permanent solution of the problem of food distribution is the establishment of receiving terminals along the water front of all five boroughs of Greater New York. There should be three or four on the North river; three or four on the East river for Manhattan; three or four in Brooklyn, and one or more in the Bronx, in Queens and in Richmond. These should be so located that cars could be run directly into the terminals from the railroads or from car floats, and should be distributed so as to be most convenient to the consuming public to avoid long hauls to the retail stores. These terminals should be large enough to discharge many carloads of stuff at one time on the ground floor, with proper platform, trucking spaces and elevators. The buildings should be seven or eight stories high with cold storage and general storage equipment. The top story should be devoted to the manufacture of surplus stock or goods liable to waste by deterioration.

To these various terminals the general food supply of the city should be directed by intelligent management to meet the requirements of each section. This arrangement would distribute the bulk of food stuff, upon its arrival, to the approximate sections of consumption, and would avoid the congestion, delay, long hauls, injury to many products from exposure, numerous middlemen's profits and incidental expenses now involved in focusing the receipts of nearly all food stuffs on the lower west side of Manhattan Island.

These receiving terminals should not be used as retail markets. It is absurd to expect housewives generally to go long distances, and especially into undesirable localities, to purchase daily supplies. Receiving, warehousing, manufacturing and wholesaling should be located on the water front or convenient to railroads or docks. Retail food stores should be located where the people live. The city should provide these receiving terminals as an important factor in the welfare of the whole city, quite as important as the water supply, rapid transit, and many other public enterprises, practically beyond private capital. The investment by the city would be self-sustaining, as private capital can be found to operate the business and pay adequate rentals.

I have tried to show that the first requisite for a scientific, successful, permanent system of markets for Greater New York is the establishment of a sufficient number of receiving terminals with storage and manufacturing facilities; that those receiving terminals should be properly distributed in all the boroughs, so that food stuffs could be brought close to the consuming public with the initial shipment.

We will now consider the retail distribution of food. The city should be divided into districts containing from 30,000 to 50,000 population, according to the density, and in about the center of each district there should be located a large, well-lighted, properly-constructed department food store, with every modern appliance and sanitary safeguard. The interior should be arranged in compartments for the proper grading, classifying and handling to advantage all goods assigned to each department. All modern labor-saving devices should be installed, to secure the greatest economy and efficiency. The place should be clean, orderly and attractive. Each department should be under the charge of a trained expert in his line, and he should be held accountable for results. The whole store should be under the supervision of a competent manager. No misrepresentation of goods should be tolerated, and prices for the same grade of goods should be the same in all the district food stores throughout the city. Grades should be standardized and uniform. All kinds of food stuffs to be found in the city at any season of the year should be carried in every store, thus obviating the necessity of shopping. Deliveries should be made at stated times, regularly, and never outside the boundary lines of the district served by a particular store. A small charge based on weight or bulk should be made to encourage the taking home of small purchases. Do not send a man and horse a mile to deliver a yeast cake or a loaf of bread. Hundreds of thousand of dollars are wasted now in frequent, distant, and highly multiplied deliveries by rivals in trade. The condition is woefully chaotic.

Supplies for these department food stores would be received daily from the receiving terminals on the requisition of the expert buyer for each store. The wholesale price should be as low as possible, having due regard for the producer. The retail price should be the cost plus the expense of doing the business, as no private gain should be permitted. The operations should be conducted on the cooperative plan, so that every producer and every consumer would share in all the profits as specified in the cooperative corporation law passed in 1913, and the capital invested would receive only 6 per cent, as specified in said law. This system would absolutely do away with fraud, deceit and misrepresentation to either producer or consumer. The whole business would be their business, conducted by experts for them, under economic conditions.

I realize that the plan is large and will require much capital, but the business of feeding New York is a large business, and, like the river, goes on forever. There is no use of going wrong because it seems hard to begin to go right. The State Food Investigation Commission reported two years ago that under a proper system of food distribution the consumers in New York City would save from $60,000,000 to $100,000,000 every year. Think of it! Save five times as much every year as it would cost to establish once for all time a proper system.

The enormous waste of food products, both in the country and the city, is a great economic blunder. Thousands of tons of fruit and vegetables are left in the field to perish — most of it good, wholesome food — simply because under present conditions there is no way of marketing it for enough to pay for labor, packages, transportation and sale. Nothing is done to stimulate demand by consumers by lowering prices at retail and giving wide publicity to the fact that there is a large surplus to be had cheap. The retail store sells lima beans at fifteen cents per quart when the commission man sells for the farmer at thirty, forty or fifty cents per bushel, which is about one-half of the cost of harvesting and sending to market. Cauliflower retails for fifteen to twenty cents per head, when a barrel of twenty to twenty-five heads sells in Washington street for seventy-five cents to $1. The same is true of many other articles. Last year a medium-sized head of cabbage retailed for ten cents, when the price in the country was $25 to $30 per ton, but the year before the retail price was the same, and in the country cabbage would sell for only $2 per ton f. o. b., and hundreds of carloads rotted on the ground. It is perfectly clear that something is wrong.

Another great waste occurs in the city by reason of periodic "gluts" in the market, and the spoiling of perishable fruits and vegetables in retail stores. Go along Washington and West streets and along the docks and the marginal street from Fulton to Canal and above, and see the tons of food stuff wasted and dumped. Observe the barrels and garbage cans taken daily from every grocery and from other food stores. The food wasted in New York City would feed nearly half the people. It is not possible, this side of famine, to stop all this waste, but a large portion can be saved. I shall speak of the country later, but now I wish to show how much may be done in the city, under a proper system of marketing, to prevent waste.

I have indicated that on the top door of every receiving terminal and storage warehouse there should be a manufacturing plant, fully equipped with the most modern appliances for canning, preserving, salting, pickling and otherwise saving and conserving all wholesome food that comes to the city. If it comes in such quantities that current demand will not absorb it, put it in storage or send it at once into the factory. Or, if it be in such tender condition that it will not stand offering at retail, send it to the factory. Each day when the trucks make the deliveries from the receiving terminals to the retail department food stores, let all products that are not in prime condition to sell at retail be put onto the trucks and returned to the factory. In this way gluts will be prevented, all wholesome food will be properly manufactured and saved, and only fresh, prime food will be offered at retail. These manufactured products will go from the factory into storage and into the retail stores for sale the same as though they came from factories in Ohio, North Carolina, or any other section of the country. In a great center like New York these factories would be run all year round, as there would be a constant supply of material focused here from all parts of the country and from foreign countries. This would not hold true in smaller towns, but much can be done there and in the country to prevent waste.

I have spoken of saving waste, particularly in New York City, by having properly equipped manufacturing plants located on the top floors of the twelve or fifteen receiving terminals, where all food stuff liable to waste by deterioration, and all surplus, can properly be manufactured and saved.

Now I wish to show you how the whole system of marketing and manufacturing surplus can be applied to the entire country. In every city and large village the receiving terminal is the first requisite, but in small towns a single building of proper size, properly located, will serve as a receiving terminal, retail food store and factory. It would be the whole system condensed to meet the local requirements, but still complete in all essentials. At such a terminal all food stuffs produced locally could be properly sorted and prepared for the local retail trade, the surplus of marketable produce could be graded, packed and shipped to the best available market in carload lots, and the unmarketable stuff manufactured on the premises. It would not be necessary to have a factory in every village in connection with the receiving terminal and retail store, but one could be located most conveniently for other towns, within a radius of ten or fifteen miles, to send their produce for manufacture. This would save expense of building and equipment in every small town and would furnish the means of saving all wholesale food products in the territory, and give employment to many people. The great advantage of the system would be that the receiving terminal would furnish a local focusing point for all the produce of the surrounding country, the local demands could be met by the retail department, and the surplus could be properly graded, packed and shipped in carload lots, all of which is now impossible with the unorganized individual producers. It would likewise supply the local demand at retail, instead of having local products sent by the individual producer to a distant market to be sold and handled by several middlemen, and then reshipped to the locality where it was produced to supply the retail trade, as is often done under existing conditions.

The system necessarily involves cooperation, and cooperation will be the salvation of the farmers, and will solve the problem of the high cost of living. It will bring producers and consumers into direct business relations, and cut out middlemen and all profits except those that accrue to the producers and consumers. The business will be handled by experts, who have no selfish interests to serve, but simply act as the paid agents of producers and consumers to perform the work of distribution in the simplest, most direct and most economical manner possible.

THE PRESIDENT: Is there anything to be said on Mr. Tuttle's recommendations?

MR. SCHRIVER: This is a very exhaustive paper on an exhaustless subject. The question that disturbs my equilibrium in thinking is, — how he is going to make it work? It would be a delightful situation if it was only in working order and running now, but how are we going to get that beautiful picture into practice. I am ready, and I think we are all ready, to endorse the paper, because it presents in a very elaborate, intelligent and yet concise way the thing we need.

I move that we endorse Mr. Tuttle's recommendations.

Seconded.

MR. TUTTLE: Before that motion is put I want to answer in part the question raised by Mr. Schriver. The Department of Foods and Markets, although very young and only just organized, has already assurances of three of these receiving terminals of ample size, with cold storage and dry storage capacity, and with manufacturing facilities located very satisfactorily for distribution of food over a large section of New York City, and part of Brooklyn. Efforts will be made almost at once, just as far as it is possible to progress these efforts, to have the retail distribution provided for. We realize that it is not sufficient to have terminals, — if we had terminals and no retail outlet, we would be covered mountain high with produce in forty-eight hours in New York City. We must have a retail outlet provided for in order to operate a terminal warehouse. This is the ultimate problem to be solved in New York city.

Whether large distributing stores, as indicated in that paper, to serve 30,000 or 40,000 people, will be established, or whether the retail distributing unit will be smaller,—perhaps not over 1,000 families to a unit, with a complete food store established to serve these 1,000 families, but the territory absolutely covered, so that each unit will serve its locality and no other — has not been definitely determined. This will save, as you see, multiplicity of deliveries and much expense. These retail stores will get their supplies from the wholesale receiving terminals. These terminal markets will carry in stock at all times a supply of all foodstuffs, so that every retail store will have on hand at all times all kinds of foodstuffs. The housewife going to one of these stores can get her entire food supply from one store. That system, I quite agree, is a big problem. My friend said we would be glad if that system existed today. It does not, and will not exist for a year. But within a year I believe the farmers of this state will see that they have a system of marketing their products in New York City that is scientific, economical and cooperative.

DEAN COOK: I want to recommend this paper. It is the most complete and exhaustive report of a situtation we understand, that I have ever listened to. I should like to ask Mr. Tuttle whether this plan is to be worked out by the municipality; whether it is to become a New York City problem and be administered by the city government, or by Albany, or by any other town, or whether it is expected this will be worked out by corporate interests.

MR. TUTTLE: At the present time it is not a municipal operation. The city of New York is considering at the present time the establishment of some of these terminals and storage warehouses — one particularly at the Wallabout Market — but I presume that everyone knows that municipal operations move slowly, and state operations oftentimes move slowly.

At the present time I am violating no confidence in saying that the New York Central has given us assurances that it will establish for us just such a warehouse as we want on the west side of Manhattan Island, about 34th Street, which is very central, where there will be no difficulty whatever in receiving carload lots from the New York Central lines and from other lines by car barge float approaches.

Another terminal which we have been given assurances will be provided, will be just opposite 34th Street in Long Island City, in connection with the Long Island and Pennsylvania Railroad freight yards.

We have also assurances from the Bush Terminal people in south Brooklyn that they will build for us just such a warehouse as we want, and there they also have facilities for getting cars by floats speedily to their property.

THE PRESIDENT: Any further discussion on this paper? If not, you have heard the motion — it has been moved and seconded that we adopt the recommendations of the paper.

Carried.

MR. SCHRIVER: I rise to a question of privilege. I think that the people ought to have a right, a privilege, to dissent to things that are sometimes done by public officials. They ought also to have the privilege of endorsing them. They should improve their opportunities to make themselves felt, especially in all public matters. This society represents the entire state, and since last we assembled here the President of our society has been appointed to an important office. He was possibly considered because he was elected to this important place in our society, and I suggest that as a society we most emphatically endorse his appointment to this important chairmanship. I make that motion.

Seconded.

MR. BOSHART: I shall rise to put the question.

Carried.

THE PRESIDENT: Gentlemen, I should not assume to say that I could be displeased with such an expression of your confidence and your approval, notwithstanding the fact that things of that kind are a little embarrassing to me. I think that I should be less than human if I did not appreciate it, and I want to thank you for it.

We are nearing the noon hour and we have a business meeting in the afternoon to carry out the requirements of the constitution of the New York State Agricultural Society. As preparatory to that we are required to have a Committee on Nominations, and for that committee I shall now name: H. O. Palen, Wing R. Smith, C. Fred Boshart, Ezra A. Tuttle and Augustus Dennison.

For the Committee on Resolutions, I name: W. N. Giles, Ira Sharp, L. L. Morrell, Harris Moak and Albert Manning.

The recommendations of Mr. Boshart's paper and his resolution requires the appointment of a committee to cooperate with the Commissioner of Agriculture and the Commissioner of Foods and Markets to unify some of the work. For that committee I shall name: F. W. Sessions, Dean H. E. Cook, C. R. White, M. C. Burritt and Dean B. T. Galloway.

THE PRESIDENT: If no member of the society has anything further to bring before us at this time, a motion to adjourn will be in order.

MR. BOSHART: As we now have a Committee on Resolution and it has always been the custom of this society to hand in resolutions and refer them to this committee without reading, I move that such be the procedure of this meeting.

Carried.

Meeting adjourned on motion.

AFTERNOON SESSION

THE PRESIDENT: The constitution of the State Agricultural Society provides for the holding of the annual business meeting on this date, so that we will have to ask the indulgence of those who are not members for a little time, while we are disposing of this work. It will not take long. The first part of this program is the report of the secretary. Mr. Brown is not here just now, but he will be in a few minutes. We will have the report of the treasurer.

REPORT OF TREASURER

HARRY B. WINTERS

The following is a report of the finances of the society for the year ending today:

Receipts

Balance on hand January 21, 1914	$280 22	
Dues, 49 annual memberships	49 00	
Dues, 6 life memberships	60 00	
		$389 22

Disbursements

Joseph J. Judd, publicity work	$15 00	
Bastian Brothers, badges	26 44	
The Tholens Press, printing	4 00	
The Ten Eyck Hotel Co., hotel bills	7 00	
Mrs. Julian Heath, expenses	14 15	
C. H. Harding, printing	10 00	
Dr. W. E. Griffis, expenses and honorarium.	40 00	
Postage	5 00	
Photograph	50	
Albany Art Union, photograph	1 00	
College Print Shop, printing	2 50	
Rubber stamps	1 15	
Postage	8 00	
College Print Shop, printing	7 75	
Joseph P. Hogan, signs	1 50	
		$143 99
Balance on hand January 20, 1915		$245 23

I should say in explanation of the small amount of receipts for the past year, that the business meeting was held last year on the second day of the meeting so that the receipts of the first day were included in the receipts of the previous year. In other words, the receipts for the calendar year would be, in addition to the memberships I have told you, 50 annual memberships ($50) and 7 life memberships at $10 ($70), total $120, included in the report of the previous year. Mr. Chairman, I move that an auditing committee be appointed to examine this report and report later in the meeting.

Motion carried.

THE PRESIDENT: Is there any miscellaneous business to be brought up?

MR. TUCKER: I should like to offer a resolution if it is the proper time.

THE PRESIDENT: Under the rules it would be referred to the chairman of the Committee on Resolutions for report without reading. Mr. Giles will take it.

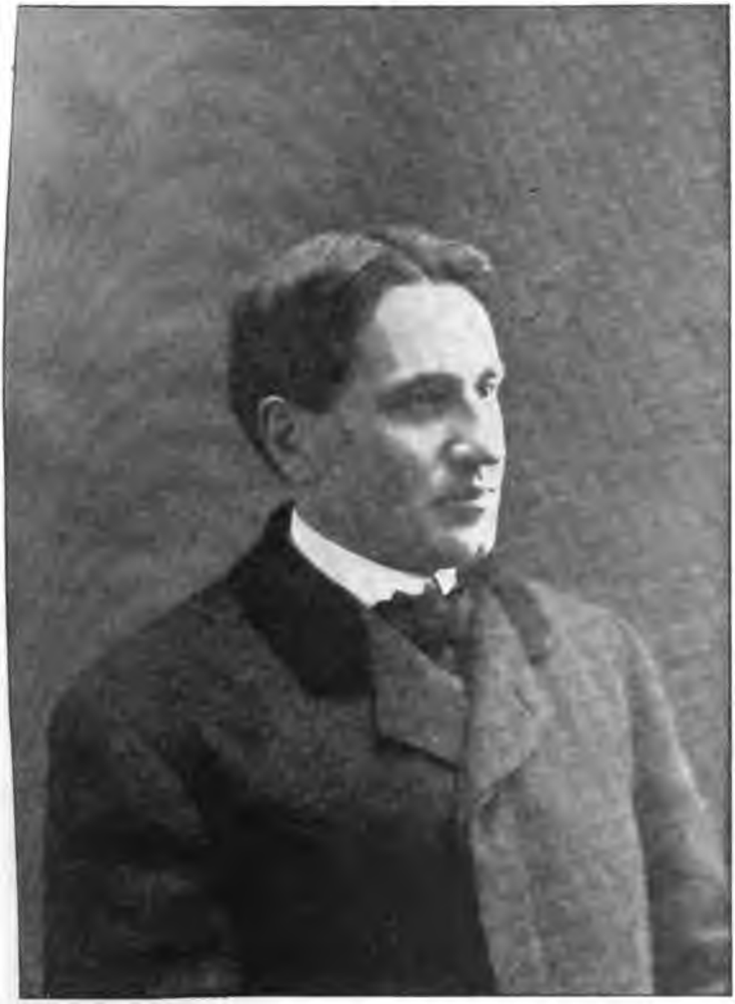


FIG. 481.— HARRY B. WINTERS, TREASURER

UNIV. OF MICH.

THE PRESIDENT: Are there any reports of special committees? If not, we come to the election of officers. We will hear the report of the Committee on Nominations.

MR. PALEN: Your Committee on Nominations begs to report, and recommends the following nominations for officers for the ensuing year:

President

John J. Dillon, New York.

Vice-Presidents

First district — Mrs. Julian Heath, New York.
Second district — Ezra A. Tuttle, Eastport.
Third district — Gilbert M. Tucker, Albany.
Fourth district — C. Fred Boshart, Lowville.
Fifth district — Wing R. Smith, Syracuse.
Sixth district — Samuel Fraser, Geneseo.
Seventh district — Seth J. T. Bush, Morton.
Eighth district — F. N. Godfrey, Olean.
Ninth district — C. C. Mitchell, Millbrook.

Secretary

Albert E. Brown, Syracuse

Treasurer

Harry B. Winters, Albany.

Executive Committee

A. Denniston, Washingtonville.
J. A. D. S. Findlay, Salisbury Mills.
C. W. Burkett, New York.
Dr. Thomas E. Finegan, Albany.
Richard T. Wainwright, Rye.
Edward van Alstyne, Kinderhook.
George W. Sisson, Jr., Potsdam.
T. B. Wilson, Hall.
F. W. Sessions, Utica.

Mr. Chairman, I move that the secretary be instructed to cast one ballot for the election of these officers.

Motion carried.

(Mr. Palen, secretary of the Committee on Nominations, was directed to cast the ballot in the absence of the regular secretary, Mr. Brown.)

THE PRESIDENT: A unanimous vote has been recorded and the officers are declared duly elected. Is there anything more to come before the business meeting of the society today? If not, this part of the program is declared closed and we will go on with the regular work of the convention.

MR. SESSIONS: Mr. Warren I. Lee of the Comptroller's office is here and would like the privilege of the floor to make a statement to this organization. I move you, sir, that the privilege of the floor be extended to Mr. Lee.

Motion carried.

MR. LEE: The suggestion has been made that a representative from the Comptroller's Office come here and tell this body something of that which Comptroller Travis is doing to see to it that the state and county fairs are honestly and efficiently conducted.

When the Comptroller took office it was discovered that a most amazing situation existed in many counties of this state in respect to the county fairs. I am a country man myself; for twenty-five years I lived in Oneida county. I was born and brought up on a farm and to the farm now I pay the greatest homage and attention. I know something of the importance of county fairs. I know that the farmers and farmers' wives make exhibits there, and I know that frequently the exhibit which the country farmer makes at a fair represents almost a year's effort on the part of himself, his wife, and often his children. If it is designed to, for instance, exhibit a herd of cattle, or horses, or poultry, the whole family effort for a year is sometimes devoted to seeing to it that the exhibit when made is awarded a first premium. In other words, when a farmer at a county fair makes an exhibit, if he wins out on it and takes the first prize, it means to him what success in my profession means to me. It goes without saying, therefore, that it is important that the awards are honestly made.

In the investigation which Comptroller Travis has made and is making, in various counties of the state, it has developed that in some of the counties premiums are paid to exhibitors who never exhibited anything at any county fair in the whole history of that agricultural society in that county. Some almost humorous instances have developed. In some of the counties of the state men who never owned a farm, and never made an exhibit, have been awarded first premiums in butter-making, for a herd of choice cows, for poultry, or for swine. We have an instance of one man who, by dint of careful economy, was able to buy a quart of milk every morning. He never owned a farm, never worked on a farm, never made an exhibit, and yet he is down for receiving a prize for fancy butter-making and for a herd of choice cattle. And the viciousness of it is, that while that man has been awarded premiums on exhibits which he never made, some honest agriculturist has been deprived of the premiums to which he was entitled, and the money has gone dishonestly to men who are not entitled to it.

That, in brief, is the situation which exists in very many counties of this state. And it seemed to Comptroller Travis that the state agriculturists and farmers would be interested to know what he is doing to see to it that the fairs in the various counties are honestly and efficiently conducted, to the end that awards when made will be made in a proper way and to the people who are entitled to them. The Comptroller has authority to investigate these matters because the premiums are paid by state money, from an appropriation made by the state.

Now, gentlemen, this in brief is the work he is doing as I have undertaken to explain it today. I feel entirely sure that you will back him up, because it is work which the Comptroller is doing for you — there is no glory in it for him. He is doing it for you and I am perfectly free to confess, even if you do not back him up, his duty is such he has got to keep on doing it. I hope I have given you a synopsis of the present dishonest system and of the corrective measures which the Comptroller is intending to adopt. There are very many things I should like to tell you, that I cannot, because they involve evidence which cannot be disclosed at this time. Suffice to say that no inquiry has ever been made into these fairs by any other comptroller of the state. This comptroller is going to make such an inquiry and is sure of substantial results. Hereafter, when any of you gentlemen, or your neighbors, make an exhibit at the county fair, you can be sure that even though you may not get the first prize or premium, somebody who never made an exhibit is not going to get it.

MR. SCHRIVER: I presume that every man here is connected in one way or another with the agricultural fairs. This disclosure made from the Comptroller's office is astonishing and humiliating to us all. I move that we unqualifiedly condemn all these irregularities wherever they are discovered and by whatever name they are known, and that we commend the effort and purpose of the Comptroller in seeing that we have an honest administration of the fairs. I move the condemnation by this body of that sort of procedure, and its commendation of the Comptroller who is discovering these things and seeking to correct them.

Seconded.

THE PRESIDENT: As the Chair understands it the motion expresses the condemnation by this society of any element of dishonesty in the management of a county fair, and the approval of a state official for ferreting out and making known dishonesty that does exist.

Motion carried.

THE PRESIDENT: The New York State Agricultural Society has always opposed dishonesty in any phase and in any place. We reiterate it now.

It will be necessary for us to divert a little from the printed program. Mr. Wadsworth has written me that he would not be here because of an unexpected engagement, so we have changed the program around a little, but we have just as good things this afternoon as if we had followed the regular program, and better things tomorrow. Mr. Fraser is also detained until tomorrow. That brings us up to one of the best things that we hope to have during the whole session. We were fortunate enough to secure the services this afternoon of a gentleman who is not only known nationally but all over the world for his agricultural work as an organizer. Most of you know of him and his work, and I shall simply introduce Dr. Galloway of Cornell University.

COOPERATION IN AGRICULTURE, AND THE FACTORS THAT MAKE FOR SUCCESS

BEVERLY T. GALLOWAY

So much is being said and written at this time on the subject of cooperation in agriculture, that one may well raise the question whether the issue will not be further confused by continuing the discussion. At the risk of doing this, a few suggestions are offered in the hope that what is said may direct the attention of those whose duty it is to shape public sentiment and to educate both the producer and the consumer.

THE DEMAND FOR ORGANIZATION

As a means of establishing a background for what we have to say, it may be well to review briefly the growth in this country of the movement for organization among the farmers, to the end that a more equitable share in the profits of their labor may be secured. For the past five or six years I have been so situated as to be in a fairly good position to watch the barometer of public sentiment through its reaction on the members of the National Congress. Judging by the hearings and discussions before committees, and judging further by the bills introduced with little or no expectation that they will ever be passed, the great pressure for action in the matter of securing changes in the present methods of distributing and marketing farm products has come not so much from the farmers themselves as from those who are non-producers, and who are feeling the pinch of the constantly increasing cost of living. There is a great ground swell of interest, almost anxiety, that the farmer should do something, or that something should be done for the farmer, to relieve the present situation, which is growing more acute all the time in all countries the world over. The subject is therefore world-wide in its bearings. Its economic, ethical and social ramifications are far-reaching and intricate, and it will doubtless be a long time before a sensible impression can be made on the many-threaded and tangled skein. There would appear to be no question that many of the efforts and movements being made are born of the best intentions; but from the very nature of things they are destined to fail, for the reason that they are built on the shifting sands of theory rather than on the solid rock of experience.

ESSENTIALS FOR COOPERATION NOT CLEAR

Man's great struggle in bringing himself out of the abysmal darkness of barbarism has been to find practical ways to live, to work and to play in cooperation with his fellow man. Progress in this matter has never been continuous nor in straight lines. It never has proceeded, and in all probability never will proceed, from above. It must come from within. So that, looking at all that is now going on in the way of national and state legislation to bring about cooperation willy-nilly, we may regard it as a necessary step in the evolution of public sentiment. Out of it there will doubtless come, step by step, a clear vision of the essentials, and as these come they must be seized and held until another safe footing can be secured.

In some ways democracies have advantages in pushing forward the economic and social welfare of the people. It is an expensive process, however, and while many mistakes must necessarily be made, there is never removed the power of correcting them. Democracy breeds independence and individualism — marked characteristics of every American-born citizen. Nearly every man, especially if he is a producer of crops, has the feeling that he would like to be free and unhampered in everything pertaining to his work — the making of his product, its distribution and its marketing. Now, it is a well-known fact that as a rule the producer of crops — the farmer — has little knowledge of the essential elements of business. He is not a trained business man. Therefore, he is not, by training and experience, in a position to meet business problems and to handle them in a businesslike way. What is true of the farmer is true to a large extent of the ultimate consumer of the things the farmer produces. So that here we have the necessary material and basis for the growth and production of a very complicated and organized set of men that fill the gap between the producer and the consumer.

The farmer, bent on his desire to produce crops, and not realizing the advances being made in the matter of organized business and business conduct, fails to appreciate that the power to act independently and individually has been largely taken out of his hands. He also fails to realize that that power is going to stay out of his hands, and that the only hope for the future is to get into the full current of economic progress.

THE FARMER NOT A CAPITALIST

For years the farmer has been led to believe, and in the majority of cases he still believes, that he is not only a capitalist, but also a laborer and the manager of an industry. This is true only where the farmer is so fortunately situated that he can act not only as a producer, but also as a transportation agent and a direct salesman. Such instances are rare; so that the millions of husbandmen must now, and even more in the future, recognize that the very instruments which in their own hands would make them capitalists, laborers and managers of industries, are now in the hands of others and are likely to stay there. In other words, there was a time when the farmer was practically the master of all the tools of his profession. He is no longer that master. Transportation companies and corporations, storage and warehouse organizations, commission men, jobbers, middlemen and dealers are all a part of the organized machinery with which the farmer has to deal. So that it is no wonder that, working as he does, he can retain such a small part of what he actually produces. While the past four or five decades have greatly increased the productive power of the farmer, he has in no wise profited commensurately with this increase in productive ability.

INCREASE IN PRODUCTIVE POWER OF THE FARMER

Fifty years ago it required nearly five hours of human labor to produce a bushel of corn. Now the same amount is produced with little more than thirty minutes of human labor. The cost of production has been reduced from about thirty-five cents a bushel to less than ten cents a bushel. Has the farmer received a fair share of this profit? The human labor required in producing a bushel of wheat is now probably less than ten minutes. Fifty years ago it was eighteen times more than this. Forty years ago it required thirty-five hours of human labor to produce a bale of hay. Scythes, pitchforks and hand-balers were time consumers. In fifty years the human labor required has been reduced to eleven hours. By all the rules of justice and by the laws of economics, the farmer should be receiving today eight or ten times larger returns from the product of his labor than he did forty or fifty years ago. As a matter of fact he is receiving no such increase, so that one of his present problems is how he can get more.

It is not to be expected that the farmer will be able to revolutionize society to the extent of having it return to him the power to receive the full fruits of his labor. He must have a larger share, however; otherwise the people — the non-producers — must make up their minds to pay the cost, or else must greatly simplify their methods of living both as to food and to clothing. Doubtless the latter will be the ultimate result; but it will take a long time to reach adjustments such as are found in Japan and some older countries where living has been equalized and simplified to a degree well worthy of careful thought and study on our part.

FARMING MUST BE ORGANIZED

And now, with this background, let us see what some of the practical things are that we can do to meet the issues before us — things that not only will serve some immediate practical end, but also will be of such a nature that their general tendency will be in the direction of the development of an economic fabric, just to the producer, just to the consumer, and just to all those necessary intermediaries who are a part, and must in a large measure continue to be a part, of our advancing civilization. Thus, without further argument, if argument is at all necessary, we arrive at our first proposition; namely, that if agriculture is to continue to prosper under a democratic form of government, if we are to be a nation of freemen of the soil, if we are to avoid coming to what all the older nations have come to — an agricultural peasantry — we must organize industry. And that means cooperation.

COOPERATION CANNOT BE FORCED

It may sound like heresy or may savor of the paradoxical when I say that it seems to me that the combined efforts of the Federal and State Governments, through legislation, have done as much to set back progress in the organization of agriculture as almost any

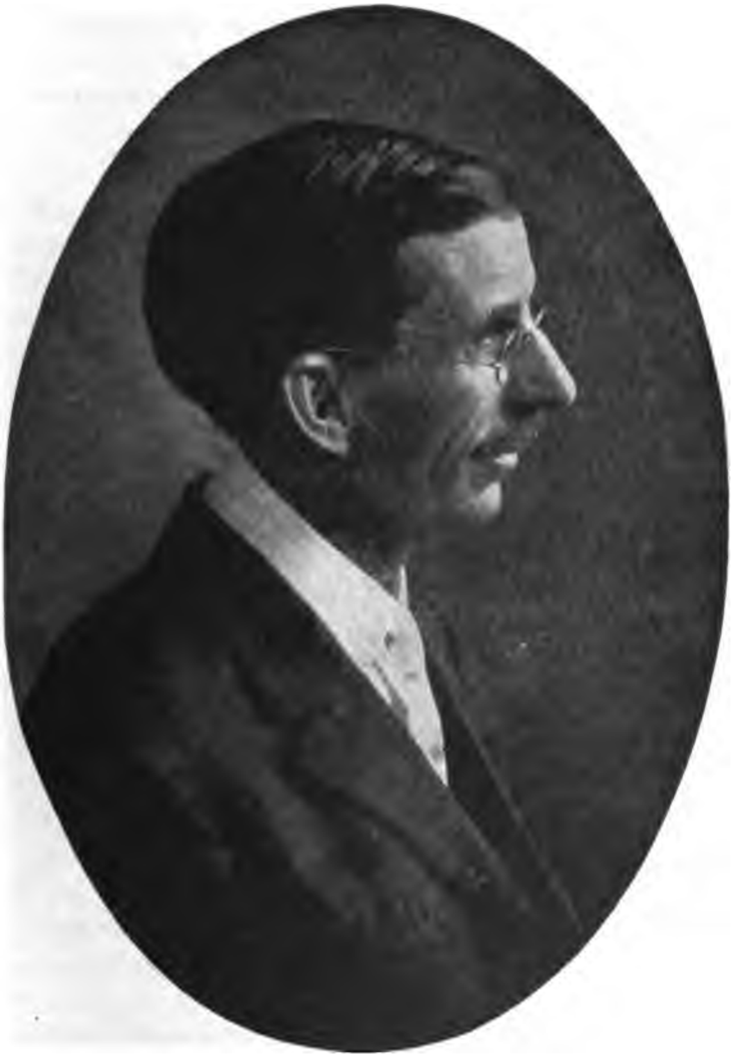


Fig. 482.— BEVERLY T. GALLOWAY, Dean, State College of Agriculture, Cornell University

other one thing. The tendency of most action coming out of legislation is to force something down on the farmers from above, rather than to build up a structure from below. No amount of legislation, no amount of evangelism, no amount of propaganda, will permanently establish organization and coöperation unless there is involved some vital, persistent, economic necessity or some great moral question that goes to the very root of life itself.

NEED FOR SMALL BEGINNINGS

For all practical purposes we can concern ourselves at the present time with those matters that have to do with material things. We must begin at the business end, and when we learn a few of the small elementary things to be done there, and how to do them, we shall have made the beginning of further progress into more complicated fields of endeavor. I think all of us will realize, on a moment's reflection, that the old order of things has passed away, never to return — when the farmer did not need to look beyond the horizon of his own community in the shaping of his work and of his life.

Railways, trolley lines, the telegraph and the telephone, have made of the farmer a world figure. He must think, must work, and must act as a man of the world. He must look beyond his community, his state, and even his own country, for the influences that govern his life. Recognizing these facts, it would seem that the safest and most tangible place to begin in the organization of rural life is with the things the farmer has to sell and those he has to buy. I am free to say that, after a study of the subject during the past three or four years, I should hesitate to attempt as yet to organize anything with the predominant idea directive rather than investigative. I think it is very proper to raise the question whether we are ready to give specific information or direction as to how, when, and where to organize. Organization is a very human thing, a very personal matter, and to attempt to deal with it in any way except largely on a personal basis is doomed to failure. We are getting a good deal of advice and help from economists, but we lack the practical, first-hand knowledge as to the facts.

NEED FOR LEADERSHIP IN ORGANIZATION

Speaking in general terms, there are two kinds of leaders of men — those who are able, capable and willing at all times to express their views as to how to do things and what kind of things should be done, and those who do things but talk and say very little about them (I have in mind some prominent men in political life), drawing their inspiration in many cases from those who have done the talking. Of course there are all shades and gradations between these extremes. So far most of the effort in this field of rural organizations has been put forth by the men who have been telling us the things that should be done and how to do them. It seems to me that we have reached a time when the constructive organizers should be given an opportunity to develop, in very small ways at first, some of the things about which so much has been said. Leadership in investigation and organization seems to be the crying need at the present time.

APPLICATION OF THE LABORATORY METHOD

In the study of the growth of crops, the breeding of animals and plants, diseases, insects, and all those things that have advanced our knowledge of agriculture, we have used the laboratory method. We have proceeded inductively. As one of our great educators has said: " This method proceeds from the observations of the concrete and practical. It seeks the fact; it thinks little of the abstract, of the speculative. It does not rely on any kind of revelation. It goes after the truth — the facts — and having observed them by eye or ear or touch or other sense process it compares fact with fact, group of facts with group, and from that comparison and the resulting classification it draws some very limited inferences. Then, there is another step in advance, not a far-reaching speculation away out among the stars, not a full-fledged theory, the very next step beyond the facts observed."

By this time you will be saying, " What is your point? Assuming that all or some of your statements are correct, what are you going to do about it? What is the practical program? What are the factors that make for success in cooperation in agriculture, and how are we to determine them?" Let us attempt to briefly answer these questions.

All those agencies, federal and state, that are charged with the work of aiding the farmer in the organization of the industry he represents, should recognize that the fundamental need at the present time is the facts. There are already in existence many forms of cooperative effort. Some of these are successful; others are not. Wrecks and near-wrecks of agencies are to be found everywhere. They all need to be studied, classified and grouped, so that safe and sane conclusions may be drawn regarding them. The Federal Government has fortunately programed its work on this basis. It is now engaged in an investigation, not a propaganda, of organized agencies involved in marketing perishable products; systems of accounting and auditing; forms of by-laws; surveys of the available market supplies; methods of growing, packing, storing, and shipping farm produce as practiced by successful organized cooperative agencies; methods of distribution, including transportation agencies of various kinds; warehousing and refrigerating concerns; public and municipal markets; wholesale terminal markets; and other allied matters.

The predominant idea here is to obtain the facts so that these facts may be used in advising and assisting, through demonstrations and otherwise, those who may wish to undertake work along the lines indicated. It is the application of the inductive method already described. The state of New York, through its Food and Markets Department, has recently entered upon a work similar in respects to the foregoing, although the predominant idea in its program is instructional rather than investigative. My own view is that the greatest permanent progress in this field is to come from the investigative side. Successful application will naturally follow as a by-product of investigative work. To advise and urge and even assist committees or individuals to organize for the purpose of cooperation in marketing farm products should not be undertaken unless previous careful investigation has shown that the chief essentials to success are present. There is a field for the agricultural colleges in the various states to aid the organized agencies, especially in the matter of investigative work. The New York State College of Agriculture has organized a Rural Community Service Committee, whose functions will be, first, to investigate organization as affecting the farmer's income, and second, to investigate organization as affecting the well-being of rural life.

Under the first heading it is planned to make a study of the existing successful organizations within the state engaged in the marketing of farm produce. The study would naturally include questions of standardization, branding, accounting, business management, articulation with consumers, advertising, warehousing and storing. Community abattoirs and transportation agencies, including parcel post and express companies, will be studied in their relation to successful cooperative effort. In this field there are also to be studied the agencies engaged in the purchase of farm supplies such as fertilizers, seed, farm implements and tools, live stock, and stock foods. There are also involved the financing of agricultural activities and a critical study of the agencies engaged in making farm loans — building and loan associations in aid of agriculture, and mutual, fire, accident, and other insurance.

Under the second heading it will be necessary to proceed more cautiously and more slowly. Organization for the purpose of aiding in the general well-being of rural life is more difficult of consummation than that of dealing with material things such as the marketing of farm products. Rural health and sanitation, and rural social technology and engineering, are all matters of vital importance, however, and must be carefully and critically studied if we are to advance the best interests of the farm and the farmer. Water supply, sewage and drainage disposal, food selection and standardization, and household conveniences, are matters that vitally concern the community. Rural education, the study of the principles governing successful work and organization for school clubs, fairs and sports, are also matters of importance to the well-being of any community. So much for the program. Now as to some of the factors that make for success.

1. It must be recognized that cooperation in agriculture is humanistic and personal, and cannot be programed, blue-printed, diagramed, or specified and set down on a group of men or a community. The motive must come largely from within and must be allowed to work outward. Little groups must first be organized with an aim, with an object that will hold them together and will give them confidence and power to gradually extend their sphere of action and of usefulness.

2. Cooperation in agriculture is most likely to succeed if it is based at first on material things. It will need to be fairly special in its application. The harvesting, grading, transporting, storing and selling of a particular crop or product — milk, eggs, butter, cheese, strawberries, lettuce and other vegetables grown under glass — are some of the special subjects that offer common ground on which a group of men may work together for the benefit of all. The limiting factor here will be the power and ability to standardize. An unstandarized product is not capable of successful cooperative handling and marketing. By virtue of this very fact the organization unit is limited by soil, climate, and all things that tend toward dissimilarity in the quality or the uniformity of the product.

3. Any cooperative effort or organization must recognize that it is in the field to compete for business. The rules governing business success must therefore be most generally and rigidly observed. A great many of the failures in the organization of cooperative agencies have resulted through lack of appreciation of the need of good business management. The most successful agricultural cooperative agencies in existence today owe their success in large measure to the business ability of the leaders. Too often it is the case that in the organization of a cooperative agency some one from the community who may have little or no experience, or very limited experience, in business matters is put in charge, with the result that the work does not live long. Trained business leaders are needed for this field of activity, and here again the College of Agriculture would serve a useful purpose if it could establish courses in which fundamental training in this line could be given.

THE PRESIDENT: Are there any remarks on Dean Galloway's paper at this time?

MR. SCHRIVER: It is the most comprehensive, best-condensed, clearest statement of the subject that we have heard in many a day. I move a vote of thanks to the Professor for that paper. It is one that will live when some of us perhaps have been gathered home.

THE PRESIDENT: There is one statement that the Chair would like to see written in letters of gold eighteen inches high — "Unstandardized products are incapable of successful cooperative salesmanship." The Dean might have added one clause to that and completed it. "Unstandardized products are incapable of successful salesmanship by cooperative enterprises or otherwise."

MR. TUTTLE: Mr. President, would it not be well to have a motion on that vote of thanks for the Dean's excellent paper? I move that a vote of thanks be given Dean Galloway.

Motion carried.

THE PRESIDENT: We will now have an address on "A Cooperative Success" by Mr. S. J. Cook, Silver Creek, N. Y., who has made a success of the practical work in his neighborhood.

A COOPERATIVE SUCCESS

S. J. COOK

The subject that has been assigned to me is, "A Cooperative Success," but after listening to the splendid address of Dean Galloway I feel that he has, in a large measure, covered many of the principal factors of cooperation, and has cited many of the practical things that are necessary to make it a success.

What I shall say will be from what practical knowledge I have gained as manager of a cooperative association. I am not a speechmaker, or an orator; therefore before I commence to talk to you I ask that you do not expect too much of me. I am a common, every-day farmer, but for the past three years have acted as manager of the South Shore Growers' & Shippers' Association of Silver Creek, N. Y. We are located in the northern part of Chautauqua County, which borders on Lake Erie and embraces the Chautauqua Grape Belt known as the South Shore.

The object of our association is cooperation, that the producer may raise better produce, packing and marketing so that the products of the farm will reach the ultimate consumer in the best possible condition.

The South Shore Growers' & Shippers' Association was incorporated under the laws of the state of New York, December 13, 1911, with a capital stock of $5,000, consisting of one thousand shares of a par value of $5 each. The stock is non-assessable.

The organization was born of dire necessity, many growers of fruit and vegetables in our locality having become discouraged on account of the low price paid for tomatoes, peas and other farm products, and the unfair treatment accorded them by the canners, preservers and speculators of farm produce. For information I think it might be well to state the conditions with which the growers had to contend before the organization of this association. In the early days of the fruit and vegetable industry in Northern Chautauqua county, growers were able to market their products independently of one another, for the reason that at that time the demand exceeded the supply.

I can remember some twenty years ago when there was a great demand for all kinds of fruit and vegetables, and we received as high as $2.00 a bushel for peas; from $2.00 to $2.50 for wax beans and about the same price for early potatoes, likewise in proportion for berries and other fruit and vegetables. With us, gardening and trucking, as we call it, was very profitable at that time, and all growers interested in the business were making money, which was an incentive for the growers to plant a much larger acreage of both fruit and vegetables. At the present time we have one of the largest grape acreages in the state. The acreage of all our vegetable crops has also been greatly increased within the past few years.

This largely increased vegetable acreage had a tendency to demoralize the nearby markets, which the growers had formerly depended upon in the marketing of their produce. There were many growers who were unable to find a satisfactory market for their products, and were obliged to accept a very low price, or let the crops rot in the fields.

The canners, preservers and local speculators in fruit and vegetables took advantage of these conditions and paid the lowest possible price; in fact they had everything in their own hands. For instance, the growers contracting for tomatoes would often be obliged to grow so many acres of peas, beans and other vegetables in order to get a contract for tomatoes, or vice versa. If the canner was getting more contracts for peas and beans and not enough tomato acreage, the grower would be asked to plant so many acres of tomatoes in order to get a contract for peas. A great many of the grower did not have soil adapted to the culture of tomatoes and it was not profitable for them to grow them, but still they were obliged to continue to grow them in order to get a contract for other products.

The contract as made between the canner and grower was a jug-handled affair; the canner was the only one to have anything to say regarding quality. Many times canners deliberately violated their contracts by refusing to accept tomatoes, berries or other produce. All that was necessary was to inform the grower that his produce did not conform to the standard, and he would be obliged to accept a cut of so much per ton, or dispose of his load to the best possible advantage himself. This unfair treatment on the part of the canners, coupled with the low prices which were then being paid, created much dissatisfaction, which brought about the organizing of this association.

Mr. F. M. Cockburn, who was elected president of our association, and myself, met in the road one day and during the course of our conversation discussed the advisability of forming a co-operative organization. We decided then and there to take the initiative. Our first meeting to talk over this matter with the growers was held in Silver Creek, seventeen growers being present, all of whom expressed themselves as being in favor of organization. This meeting was closely followed by one at Sheridan, at which time many enthusiastic growers expressed themselves as being in favor of organization. Our third meeting was again held at Silver Creek, at which time we elected the necessary officers and proceeded at once to incorporate.

One of our first problems for serious consideration was how to finance the purchase of necessary office supplies, pay manager's wages and other incidental expenses in advance of the sale of fruit and produce from which we were to obtain revenue. There was but one solution — the few hundred dollars we had received from members for the sale of stock. With this meager working capital and the loyal support of the directors and members we have accomplished many things. We have bettered the conditions for producing and shipping all kinds of farm products.

One of the first things we did was to raise the price of tomatoes one dollar per ton, and the canners stood for it. We also informed them that we would not submit to the form of contract then being used. They were given to understand that we would have some-

FIG. 483.— S. J. COOK, MANAGER, SOUTH SHORE GROWERS' AND SHIPPERS' ASSOCIATION, SILVER CREEK, N. Y.

thing to say in regard to fairness of contract relative to time of delivery, quality of produce, close of the season and payment, and for the first time in the history of the business in our locality we got a fair contract for the delivery of produce.

In 1912 there was a short cherry crop, but what we had were very large and of fine quality. The canners offered the old price of four cents a pound, but we thought we could get more money, so refused to accept the offer. We wanted to treat the canners right so we offered our cherries to them first, believing that this was the proper thing to do, because it was a home industry. They informed us that they would not pay us more than four cents a pound for cherries, and we refused to sell at this price. There are two or three factories in our locality, and they did a little scheming together to keep us undecided as to just what to do. One would advise, " Possibly we can use them next week, but are not sure." It appeared to us that there was a plan on foot to stall the sale of the cherries until it was too late or they were over-ripe, when we would be obliged to sell them at their price. We finally sold them to a broker at four and a half cents a pound and got our money before the car left the siding, saving the growers about $200.

The old price paid for red raspberries was nine and ten cents a quart; the local markets paid about the same price, but through our cooperation we have, for the past three years, received thirteen cents a quart in car lots f. o. b. loading point, and in a few instances a higher price. As many of our members grew a large acreage of red raspberries, we have saved them thousands of dollars in the sale of their fruit by obtaining better prices.

We also purchased thousands of dollars' worth of fertilizer, spraying material, baskets; packages and package material at a great saving to our growers. We saved them from three to four dollars a ton on fertilizer alone. I wish to say, however, that in the matter of handling fertilizer we tried to do the work too cheaply. We agreed to handle it for 2 per cent., which was inadequate, and we lost $160 the first year. We now charge 5 per cent. on all fertilizer, 5 per cent. on all produce loaded in straight and mixed cars, and 2 per cent. on fruit and produce sold to canners. Past experience has taught us that this percentage is as low a margin as we can safely and properly conduct the business on, and we were fortunate in making the necessary correction in time to save ourselves from becoming insolvent. While some of our members felt at that time that 5 per cent. commission was a little high, yet our past experience has proven that it was none too much for the proper conducting of the business.

The very large business which we have conducted in the last few years has made necessary the hiring of additional clerical help during the busy season; also the large local business which we handle made necessary the employment of an assistant to the manager. We employ a head bookkeeper by the year and one stenographer. Our bookkeeping is done by the double entry system, which provides a complete record of all business transacted, and we also keep a special book for monthly trial balance. Our books are audited once a year by an expert accountant.

CONTRACT WITH GROWERS FOR PRODUCE

Our first contract was little more than a gentleman's agreement, the members agreeing to grow and deliver so many acres of produce. But at times this agreement was violated. We had such confidence in one another that we believed every man would do just as he said, but I am sorry to say there were a few cases of misplaced confidence. So, last year we adopted the more stringent contract which is somewhat ironclad. It is fair to the grower, although it binds him to deliver all produce contracted for, and, although few objected, the majority contended that a stringent contract was necessary.

We also have a sale contract in which the association agrees to deliver at certain railroad stations fertilizer and all other material handled by us. The members promised to take and receive same when so delivered, and to pay at the time of delivery. I should say, in the matter of credit, that if the grower holds a contract for the sale of produce, which is satisfactory, we accept of any bankable paper bearing 6 per cent. interest per annum. It was further agreed that if the paper should remain unpaid at date of maturity we were authorized to pay the same from the moneys obtained from the sale of produce. Past experience has proved that in the acceptance of notes it is necessary to be cautious. If the grower is a practical man he will have no trouble in obtaining credit; on the other hand, if he does not practice good culture, is shiftless or unreliable, the board of directors will decide his case.

THE SALE OF PRODUCE

In the sale of produce, 80 per cent. is sold f. o. b. loading station. We prefer this to consigning, but when not practical to sell we consign to the most reliable commission men, whose reliability has been proved.

PACKAGES

We use standard twelve,- six,- and four-quart climax baskets with wooden covers for grapes, tomatoes, cherries and currants; for berries twenty-four- and thirty-two-quart crates, and for beans, peas and other fruits and vegetables standard bushel baskets. Growers must use such standards as adopted by the association and pack their fruit for shipping in a neat and workmanlike manner. They must also place thereon their number, rubber stamps bearing which are furnished by the association. The number is registered in the office with the grower's name. In this way we can trace any poor, unmarketable fruit or produce, and should a packer be able to deceive the inspector at the time of loading, his chances of getting by without being caught are very slim. It cost one grower fifty dollars last year for placing stones in the bottoms of six quart baskets containing cherries. We think he knows better now.

To educate the grower to properly pack his fruit and produce we hold field meetings at which expert packers demonstrate. This has been found to be of much value. If fruit or produce is not found satisfactory as to quality, upon inspection at the car, it is set aside, and the grower must dispose of such shipments himself.

That we have been successful in our past undertakings is shown by the large increased membership during the past two years. In 1912 we did $101,000 worth of business; in 1913, $150,000 and in the past year $233,911.23 — an increase of almost $83,000 over 1913.

FINANCE

By adopting stringent contracts for both buying and selling, it has been possible for growers who could demonstrate their responsibility to obtain credit for fertilizer, packages, seeds, tomato plants, and in fact all other commodities which are required in the conducting of their business. By each grower giving his individual note when asking for credit, he finances his own business, and it makes it possible for us to borrow from the banks and pay cash for all our purchases. Our bankers are willing and anxious to lend us money at all times. Promptness in taking care of our notes is a matter of business which is properly looked after by the management, and through the loyal support of our members and such businesslike action, we have been able to secure and maintain high business and banking credit.

EFFICIENCY

In three years the South Shore Growers' and Shippers' Association has built up one of the largest cooperative organizations in the state. It comprises the strength and influence of over eight hundred growers of fruit and produce. We have grown and marketed thousands of acres of tomatoes, and through cooperation we raised the price one dollar per ton; we have saved the growers thousands of dollars in the purchase of necessary supplies; we have loaded in straight and mixed cars, shipping and selling a variety of fruit and vegetables that were not desirable to be shipped to the nearby markets, except in small quantities; we have collected from railroad and express companies more than a thousand dollars in damage claims the past year, and paid the same to our growers with no extra expense to them.

I attribute our success to the need of cooperation. The unfairness on the part of the canners, the poor price paid by the speculator and the ruinous competition in the nearby markets, have all been remedied. Through the loyal support of our growers all has been made possible; they have been very enthusiastic and the majority are boosters. Also, the directors must be given due credit. Through their generalship and hearty support the association has avoided the obstacles which have been the downfall of many similar organizations. At different times during the year they have been called upon to pass on conditions they have had to meet in the general directing of the affairs of the business of the association.

THE PRESIDENT: We will now listen to the report of the Committee on Publicity.

REPORT OF COMMITTEE ON PUBLICITY

H. H. CHARLES

In the report of the Committee on Plan and Scope read by Mr. John J. Dillon at the meeting held January 19, 1910, appear these thoughts:

> The interests of New York State have suffered through the modesty of its citizens. States less favored by nature and artificial agencies have been exploited and boomed until the impression has found lodgment in the public mind that they afford better opportunities for farm investments and farm labor than are to be found in New York State. We would not detract from the favor and glory of other states, nor would we make a single claim for the state of New York that it does not fully merit, but we do need some honest, persistent advertising. It is well enough to discuss our own defects among ourselves for the purpose of correcting them, but we should not overlook our privileges nor our opportunities; and it is time now that we begin to focus attention on the agricultural advantages of the Empire State. The railroads are daily carrying past us to western states (and the Canadian Northwest) trainloads of labor that we need on our eastern farms. Capital, ignorant of the productive possibilities of our New York farms, is attracted by persistent advertising to the less fertile fields of the plains at much higher prices per acre, and we pay millions for canals to transport their products cheaply to the hungry people at our own doors. We need that labor. We need the enterprise that goes with that capital. The labor and the enterprise and the capital would reap greater rewards with us; we do an injustice to them and to ourselves when we neglect to tell them of the opportunities open to them on our New York State farms. If the railroads can afford to boom the west to secure their transportation, we could afford to say a word occasionally for the east to secure the fruits of their entire life. It would take a volume to enumerate the advantage of our soil and climate; of our transportation facilities and markets: of our home comforts and social advantages. We deem it to be a legitimate function of this society to enumerate the agricultural advantages of our state, and to define the superior quality of her products and to repeat them and proclaim them in clarion tones to the whole world.

"We need some honest, persistent advertising." That one line stands out stronger to me than any other part of the report. The great Empire State has advantages possessed by no other state. Let me enumerate:

New York stands first among the states in the number of dairy cows and in the value of her dairy products. Her level and gently sloping dairy sections provide most excellent pasturage, and the soils are such that any kind of feed may be grown. New York's 1,500,000 dairy cows, producing nearly 600,000,000 pounds of milk annually, are thus fed most economically, and the dairy products find cheap and quick outlet through her 2,750 milk, cheese, butter and condensory plants.

Great opportunities are offered in raising beef cattle, sheep and horses. New York's cities draw most of their meat supply from the West, paying large hauling and refrigeration fees. There is no need of it. New York City has slaughterhouses. New York State has excellent pasture, corn and clover lands at low prices — $15 to $50. She also has the finest transportation in the world. Horses are in great demand for city hauling. The crying need is for a home animal industry. The opportunity is really wonderful.

New York produces corn as good as in the corn belt. The average production of corn per acre in New York State during the period 1896–1905 was over 30 bushels. The average production per acre in Illinois during the same period was less than 35 bushels, but New York is so favorably situated with respect to markets that the value of crops in this state is above that of Illinois. The average value per acre in New York for the above period was $16.36 while in Illinois it was $11.38.

The Empire State is first in hay production and the value per acre is more too. The average value during the period of 1895–1905 for New York State was $12.41 as against $10.87 for Illinois. (These statistics are from the U. S. Department of Agriculture Yearbook for 1908.)

Alfalfa thrives in New York State. Four cuttings per year with a total yield of eight tons per acre have been secured in some of the live-stock sections where there is excellent natural drainage and the soil is deep, rich, sweet and porous.

There is no state like the Empire State for poultry. While seventh in the production of poultry and eggs, New York offers greater advantages than any other state in having cheap lands, a temperate climate, the greatest of markets, and best transportation. Her poultry industry is continually growing.

Hogs thrive on New York clover, for hog raising is essentially a pasturage proposition, and in that New York lacks nothing. Her soils, so adapted to raising clover, soy beans and for general pasturage, together with a plentiful supply of skim milk from nearby dairy plants, excellent transportation, rigid veterinary laws, etc., make hog raising in New York highly profitable.

New York's great tobacco production is a surprise to many, for its annual crop is about fourteen million pounds, and it is a highly profitable crop.

The Empire State is first in small fruit and apple growing.

FIG. 484.—H. H. CHARLES, CHAIRMAN OF COMMITTEE ON PUBLICITY

The average value of New York's small-fruit crop is $2,500,000 — greatest of all the states. New York is also first in the production of apples, six counties producing more apples than any single state west of the Missouri River. These apples are especially noted for their color, flavor and keeping qualities.

New York is the greatest truck growing state in the Union. The value of her vegetable crops amounts to $11,000,000 annually, the next biggest value being that of Texas crops — nearly $7,000,000. New York's clay loam soils are ideal for vegetable production, and quick, cheap transportation to the largest market of the country make truck gardening exceedingly attractive and profitable. The amount just stated is for vegetables, not including potatoes, beans and onions. New York is first in all of these, her potato crop being valued at nearly $27,000,000, the bean crop at $2,375,000 and the onion crop at $1,066,000 on an average.

In values of fine wheat, oats, rye, buckwheat and hops, New York State ranks among the states as follows: first in buckwheat and hops; fourth in rye; sixth in oats, and twenty-second in wheat.

The prevailing types of soil in the Empire State are loam and clay loam, with lighter soils in many of the valleys. To some extent the areas which are characterized by the production of certain crops or agricultural industries, possess distinct types of soil. Thus New York has fruit sections, live-stock sections, truck growing sections, etc., where cooperation among farmers is worked to its best advantages.

New York surpasses all other states in population. Fifty-two per cent. live in New York City alone, and less than 21 per cent. live on farms. And the numbers that move to or stay in the cities must be fed. The ever-increasing demand for food forces the buying of enormous quantities from the West and South at prices made high by long transportation.

New York needs more good farmers to till the unoccupied farm lands which may be had at most reasonable prices, and these farms are fertile, too, capable of being brought up to the highest state of cultivation. Any kind of farming can be engaged in, the products may be disposed of in any number of ways, the highest price may be obtained, the lowest freight and express charges prevail, there is excellent natural drainage, an abundance of pure fresh water, and invigorating climate. Under these conditions, why should anyone go into unsettled regions or parts less favorably situated, and pay double the price of New York land?

"But we do need some honest, persistent advertising" reads the report of the meeting held in January, 1910. Now is the time to begin. Canada advertised for farmers and she got them. Three hundred thousand American farmers were enticed onto the blizzard-swept plains of the Dominion, hundreds of miles from markets, into a vast wilderness. Then why can we not induce as good or better farmers to take up the splendid lands in beautiful New York, near the best of markets, schools, railroads, etc. It can be done and it must be done.

The so-called "worn-out" eastern farm can produce bigger yields per acre than the western farms, the price per acre and cost of transportation is far less. Tell the people about it. Just now, to tell the average western farmer of New York's great agriculture is to witness an expression of great skepticism. With comparatively little expenditure for a series of dignified, truthful, forceful advertisements, you can make him change his mind — you can make him look eastward and come eastward.

Advertising is one of the greatest factors in modern life. It is estimated that six hundred millions of dollars are spent annually in the United States for advertising. Millions of workers depend upon successful publicity to keep them employed. It builds business into great magnitude. It will build New York agriculture on a basis of permanent provision for the feeding of the great generations to come.

I am firmly convinced that it is the duty of this society to recommend to the Commissioner of Agriculture that he include in his next budget an amount for publicity purposes which his best judgment would dictate.

The President: There is no service in New York State that stands nearer to the people nor higher in their estimation than the public school system, and there are adjustments of it from time to time to keep it abreast of the times. There is no man in the state who knows better what those adjustments should be than the Honorable Thomas E. Finegan. He is to address us now on the Township School System.

THE TOWNSHIP SYSTEM AND THE CONSOLIDATION OF RURAL SCHOOLS

THOMAS E. FINEGAN

We are here this morning to consider the township system as it is generally related to the administration of rural schools. In connection with this question, although not identical in purpose, we shall also consider the consolidation of rural schools. While the two questions are closely related, they are somewhat different. Consolidation of rural schools may generally take place without the adoption of the township system. On the other hand, the adoption of the township system would do more toward the facilitation of the consolidation of rural schools than any other action which could be taken.

The term township system as applied to schools is generally misunderstood. People in the rural districts very generally interpret the township system to mean the dissolution of all school districts as they now stand, and the substitution of one single school in the town. The adoption of such system does not mean the discontinuance of a single school district which should be maintained in order to provide a school within an accessible distance of all the children living on the farms of the state. Nor does the consolidation of schools mean that school districts are to be dissolved, and new districts formed out of the territory of such dissolved districts, in such a manner as to make the distance from a farmhouse to a school so great that attendance will be prohibited. Schools will always be maintained in this state within an accessible distance of all the children who are to attend them. We must, however, take notice of the fact that conditions throughout the state today are entirely different from what they were a century ago, when school districts were first formed, or a half century ago, or even twenty-five years ago. Means of transportation have greatly improved within the last decade even beyond that which our forefathers ever dreamed. The state is expending one hundred million dollars in building highways throughout the state which, when completed, will form a network of between ten and eleven thousand miles. The construction of this vast system of state highways has been the means of inducing localities to improve the other highways of the state so, that this great system of improved highways becomes an important factor in the solution of the rural school problems. The great railroad systems and the trolley lines which intersect all parts of the state are agencies which will assist in the solution of this problem. The large number of automobiles which are owned by farmers and other people residing in the country, and the automobile 'busses which are becoming more numerous, are also factors which we may reasonably take into consideration in the determination of this question. With all these improved means of transportation throughout the rural regions of the state, it may reasonably be expected that schoolhouses may be established at a greater distance from the homes and yet be more accessible to the children than in former days when the distance was much less.

In each town throughout the state there are from eight to thirty-five separate school districts. Each of these districts maintains an independent organization with its own local officers, and each is a tax district; so that in each township there are all the way from eight to thirty-five separate and independent authorities in charge of the schools of a single town, and possessing the power to assess taxes upon the property of such districts for the maintenance of schools. This kind of an organization for the administration of rural schools has been demonstrated to be cumbersome, obsolete and inefficient. It has been discontinued in many states and must be in this state before we can improve and modernize the rural schools, and enable them to serve the people of the agricultural sections as they should and as conditions demand they shall. To make these schools effective there must be an efficient, modern organization to administer them. The plan proposed, and which we shall discuss today, is the township system. By such system we mean the substitution of a town board of education for each of the separate district trustees and boards of the several districts in a town. This town board would be chosen at a special town meeting held annually in May, at which would be considered no other matters except those related to the educational affairs of the town. This board would have the control and management of the schools in a town. Large powers in relation to school matters would be conferred on this board.

The method of control and management would be the most democratic one which could be adopted.

It should not be understood that we expect the time will ever come when there will not be a large number of one-room schools maintained throughout the farming sections of the state. It will always be necessary, in the mountainous and sparsely-settled portions of the agricultural regions of the state, to maintain one-room schools. Nor should it be understood that in urging the consolidation of schools and the elimination of as many of the one-room schools as possible, it is thought that these schools have not rendered a great service to the state. It is impossible to measure accurately the service which these schools are rendering even today. The number of men and women who received their early training in this type of school, and who have made great contributions to the commercial and intellectual development of the country, is very large. Then, too, this type of school undoubtedly has students enrolled today who will in the future make great contributions to the development of our civilization.

The question, however, is not, What have these schools done or what are they now doing? but, Are they doing for the state all that they should do? Are they managed so economically and so scientifically as to get the greatest efficiency possible out of them? Is there a financial waste or an intellectual waste in the management of these schools as they are now conducted? Can they be made a greater agency for the common enlightenment of the people, and can they be so organized and conducted as to render the larger service which our economic, industrial and social conditions demand?

Let us compare the organization and administration of the rural schools with the organization and administration of the schools maintained in the cities and villages of the state. When schools were first organized in this state, they were known as "district" schools not only in the rural sections but in the villages and cities as well. The schools in all parts of the state were known as "district" schools for the first half century of their existence. The districts of cities even had separate and distinct organizations. The movement for the establishment of consolidated schools originated as early as 1853, and New York was one of the first states of the Union to participate in this movement.

A general law was enacted in that year, known as the "union free school district law." The name of the law signifies the general purpose for which it was enacted. The object of this law was to form a union of school districts and then to make the schools free. As most of you know, we did not have free schools in this state at that time, nor were the schools throughout the country free. It was not until 1866 that New York made her schools absolutely free. Under the act of 1853, however, the schools in the cities and villages were from time to time consolidated, until all the schools of each of the cities of the state were organized into one system under the general control and management of one body. This same action has been taken from time to time in the villages, so that at the present time there is not a village in the state which maintains two separate and distinct school organizations.

Can you imagine how a plan would be received today proposing a separate school system for each school in each of the cities and villages of the state? What answer would be given by the people of any city in this state to the proposition to choose a local board for each school maintained in the city; to give to that board the power to employ teachers, fix their salaries, supervise repairs and all expenditures, and in short to have the general control and business management of the schools? Imagine a city having from 15 to 40 schools and changing the plan of organization of the school system of such city so as to create a separate and distinct organization for each school, giving to the authorities of that school taxing power, so that there would be in such city from 15 to 40 boards of control, each assessing and collecting taxes and managing and supervising the schools of such city. There is not a city in the country that would indorse such a proposition, or that would tolerate it under any conditions. There is not even a body of farmers who could be selected in any part of this state that would indorse such a plan of school administration for the cities and villages. Yet this very system of school administration exists throughout the rural regions of this state and has been in operation for a hundred and twenty-five years. There has been no change in the fundamental organization of the rural school system since the enactment of the first general law relating to the organization of common schools in 1795.

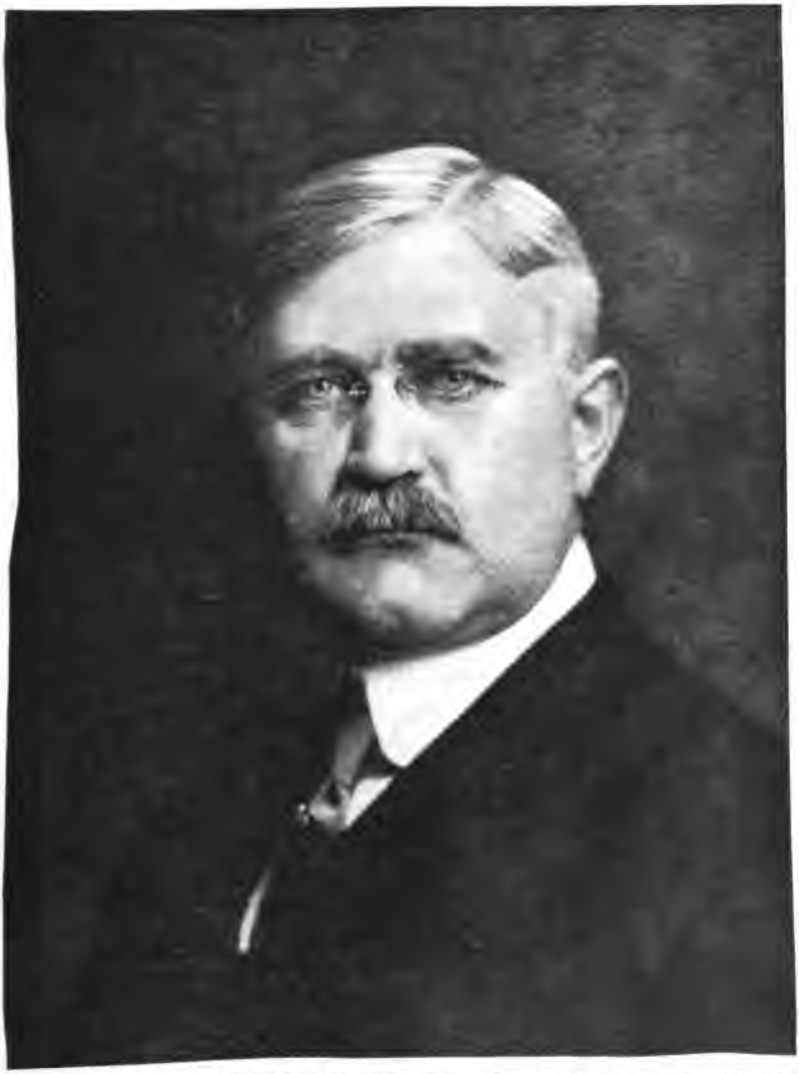


FIG. 485.— DR. THOMAS E. FINEGAN, ASSISTANT COMMISSIONER OF EDUCATION

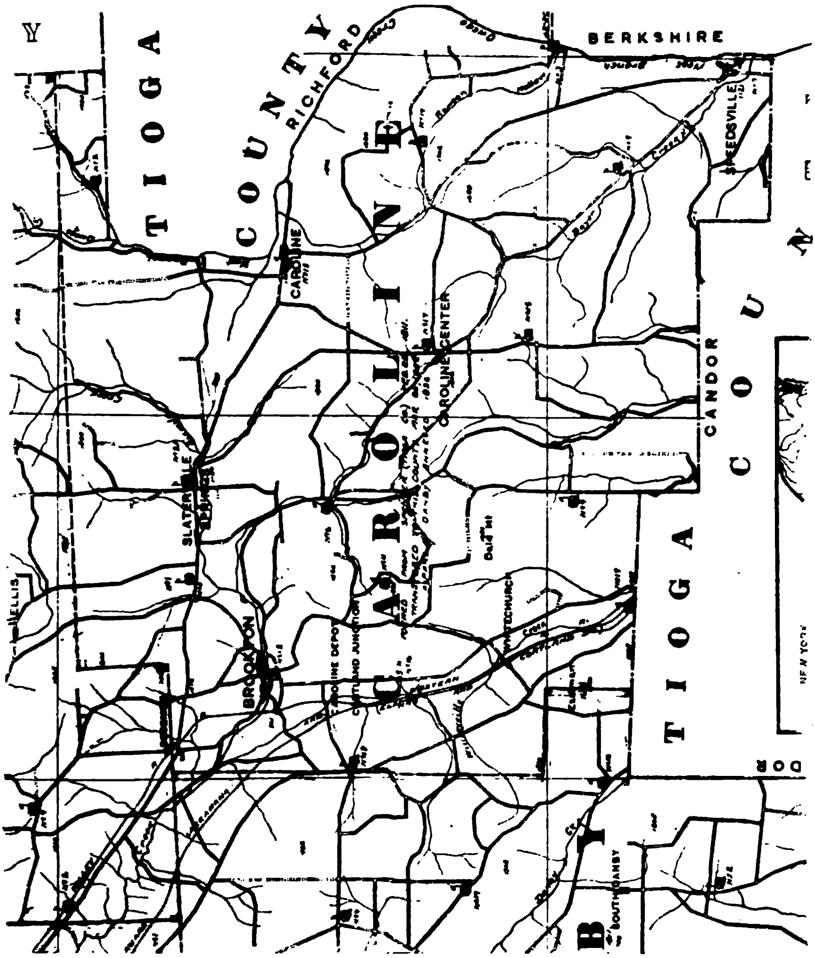
The literature of legislative reports and of educational gatherings shows that the local organization, created in the establishment of the school district system in this state, was recognized as inefficient more than half a century ago. It was the intent of the legislature to eliminate many of the weak country school districts, and that body provided for the annexation of such districts to adjoining districts. For more than fifty years the statutes have carried two provisions for the consolidation of schools in country districts. Under one of these provisions such consolidation could be effected by direct action of the authorities of the schools; but the legislature went even further than this and wrote into the law another provision by which consolidation could be effected by the arbitrary action of supervisory school officers even if the local authorities of the districts concerned would not consent to such consolidation.

Massachusetts made the same error which New York made in adopting the school district system. After she had adopted that system, it required fifty years of effort for her educational leaders to change the plan and adopt the township system. For a half century the schools of Massachusetts have been under the township system, and there is not a state that borders upon New York which has not already adopted such system of administration for her rural schools. New York, however, has not made the progress in the elimination of the unnecessary rural schools which she should have made, as only about seven hundred schools have been eliminated through the process of consolidation since 1896. Recognizing this fact, the legislature in 1913 and 1914 incorporated into the education law a provision which is intended to facilitate the consolidation of school districts, by extending larger financial aid to such districts. Under the law previous to 1913, if two or more districts were consolidated, the enlarged district, which was compelled to provide school facilities for a greater number of children, was generally apportioned a smaller amount of public money than the several districts received before consolidation. Under the statutes now, if three, four or more districts are consolidated, the consolidated district will receive the same amount of state aid as was formerly paid by the state to the several districts forming such consolidated district. Putting this principle into the law has been the means of developing new interest in the subject, and during the current year more than one hundred consolidations have taken place throughout the state.

Within the last fifteen years a movement has been inaugurated throughout the entire country, toward the consolidation of rural schools. There are thirty-five states, including the great agricultural states of the West and South, which have what is known as the consolidated school system in country districts.

It is my desire to bring before you today, as briefly and as clearly as may be possible, the general plan of the organization of rural schools in the state, and to point out their inefficiency, as well as how they may be made more efficient and serve more definitely the people for whom they are maintained. The territory outside the cities and villages of five thousand or more inhabitants is divided into 207 supervisory districts. Each of these districts is under the supervision of a district superintendent. There are 10,500 separate school districts in the state, so that each district superintendent has, on the average, about 50 schools under his supervision.

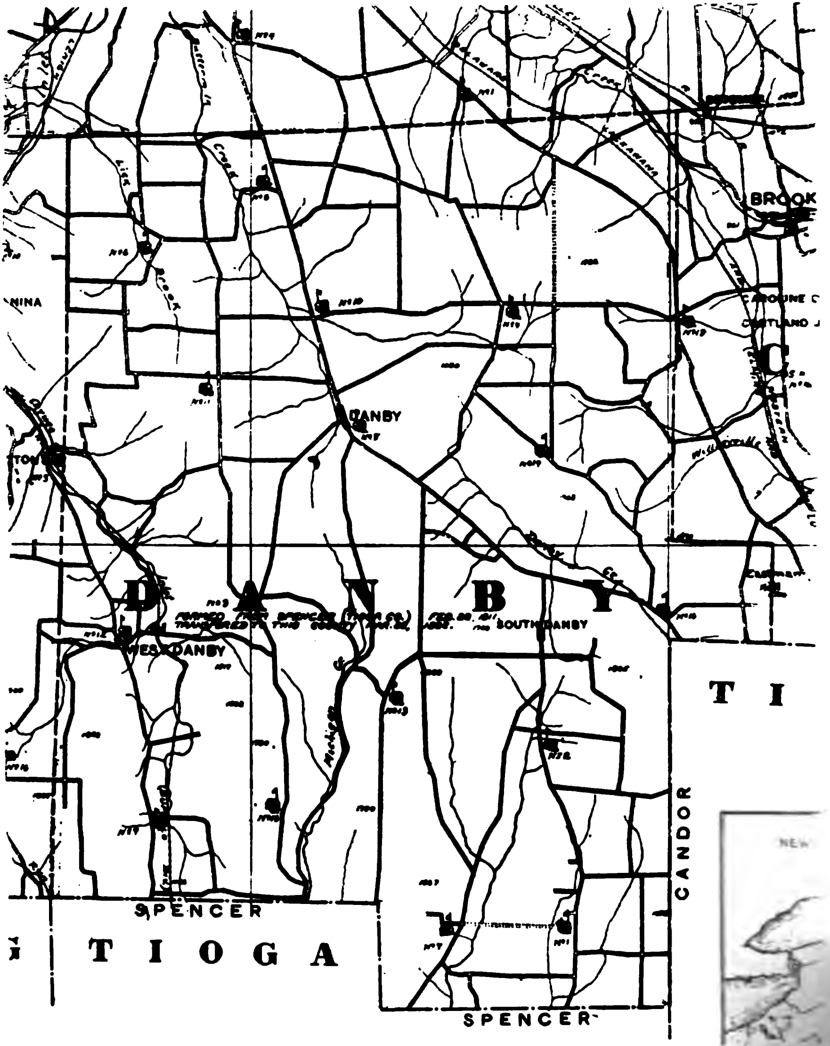
I want to visualize today the schools maintained in one of these supervisory districts. For this purpose I have selected a typical supervisory district of the state which represents one of our best farming sections. There are in Tompkins County three supervisory districts. I have selected for consideration the third district of this county which includes three towns — Caroline, Danby and Dryden — and contains 64 schools. This supervisory district borders upon the city of Ithaca, and is, of course, under the shadow of the great university located in that municipality. There is no special reason for selecting this particular district except that it is a typical district, and that fortunately the superintendent of that district has supplied me with photographs of all the schools under his supervision. I am therefore going to show upon the screen a picture of each of the school buildings in this supervisory district and pictures of the children attending the schools, so that you may view here today each one of the 64 schools in this one supervisory district. Having looked upon each school building in this district and the children attending these schools, you can easily imagine what the entire rural school system of the state is, when you consider that we have 207 supervisory districts similar to the one which you will examine today.



This picture represents a map of the town of Caroline. The miniature schoolhouses with flags at full mast represent the several schoolhouses in that town. The highways and railroads are also indicated.

(A careful study of the map was then made and the speaker pointed out how the school districts of this town might be consolidated, indicating where the central points were, and showing the distances which children would be compelled to travel to attend school under the plan of consolidation.)

(The following pictures of the school buildings, teachers and children attending such schools in the town of Caroline were then placed upon the screen.)

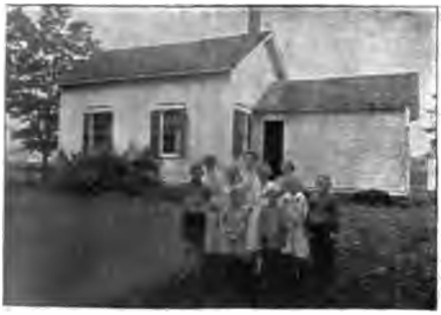


This picture shows a map of the town of Danby. The school buildings are indicated as in the previous map.

(Attention was called to the large number of small districts in the vicinity of Danby and it was stated that Nos. 5, 10 and 16, being on the state road. might easily be consolidated with Danby, and that Nos. 11, 4 and 14 might also be consolidated with Danby. It was also pointed out that No. 3 in the adjoining town might be consolidated with West Danby, and that at least No. 3 of the town of Danby might be consolidated with West Danby, etc.)

(The following pictures of the school buildings, teachers and children attending the schools in the town of Danby were then placed upon the screen.)

CAROLINE



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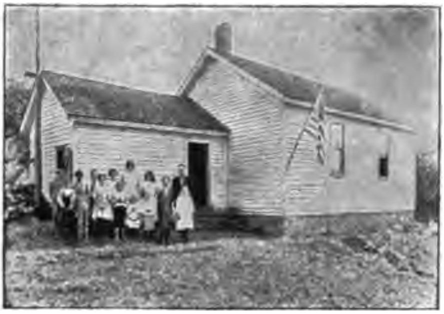

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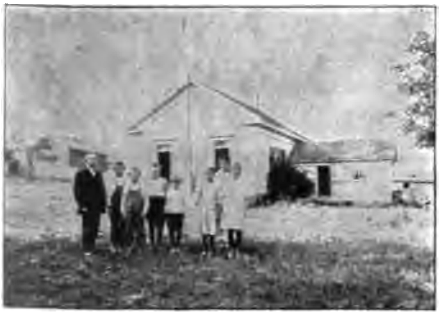

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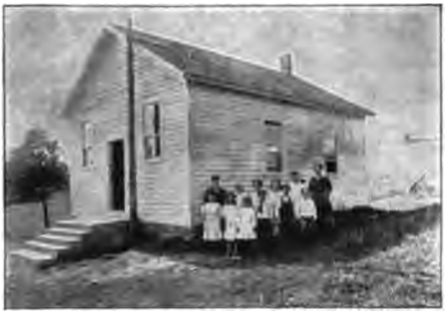
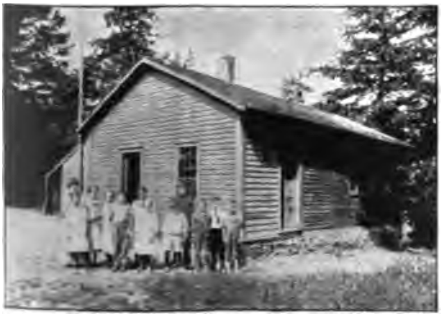


No. 4

UNIV. OF MICH.



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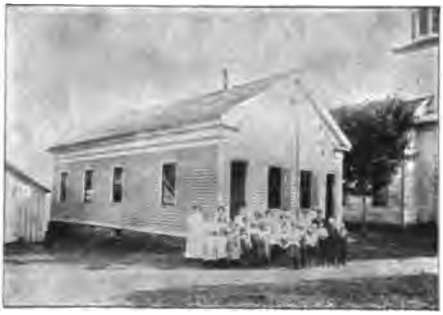

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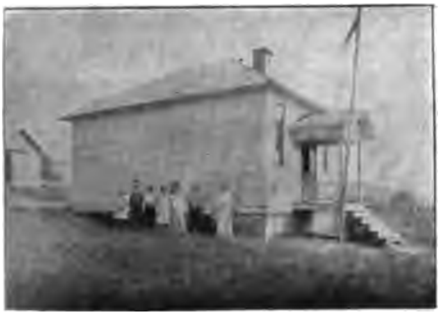
CAROLINE



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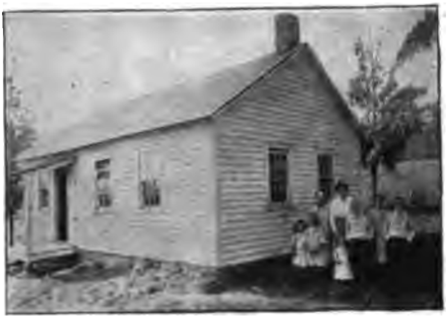

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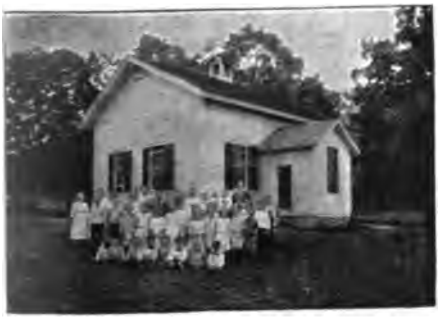

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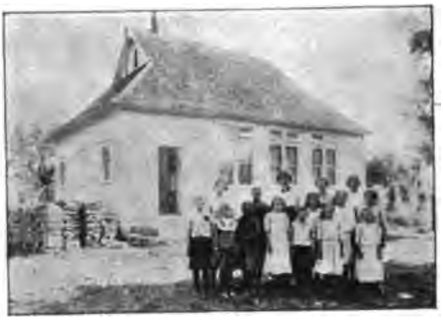

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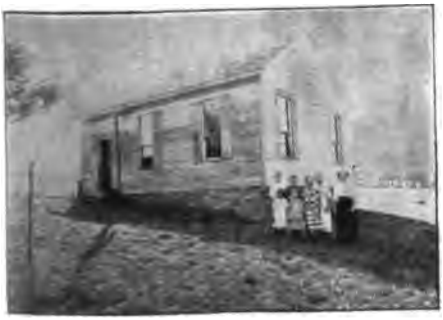

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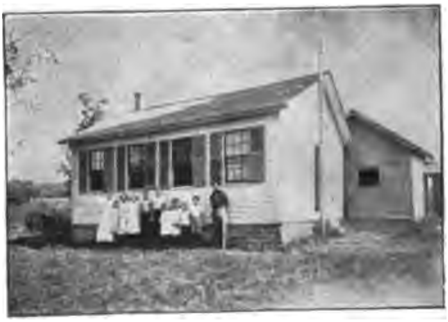

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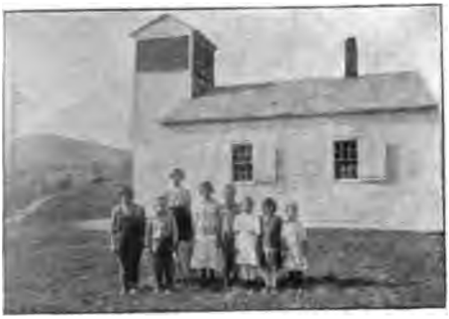
CAROLINE



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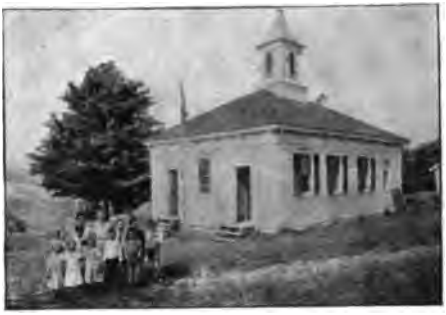

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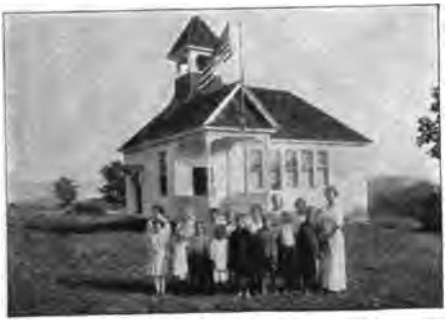

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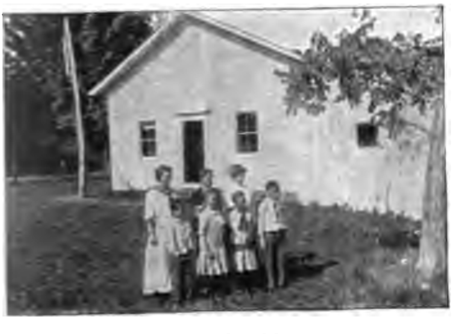

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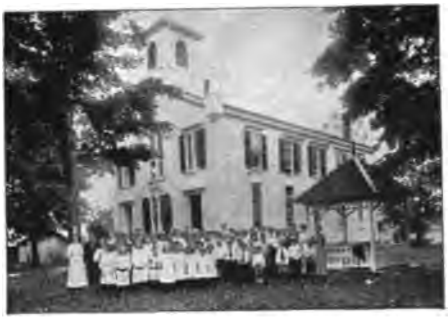

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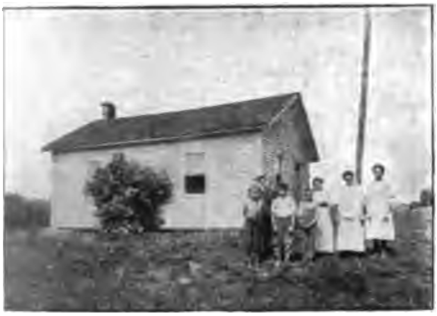
DANBY



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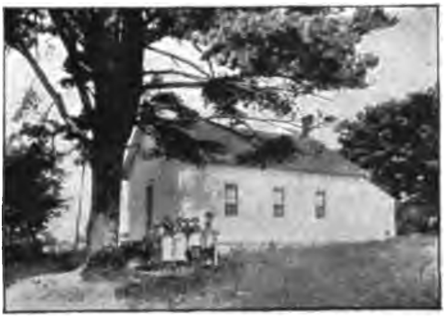

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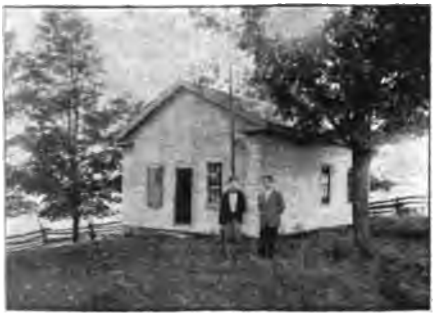

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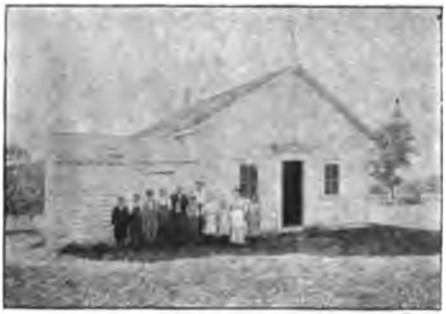

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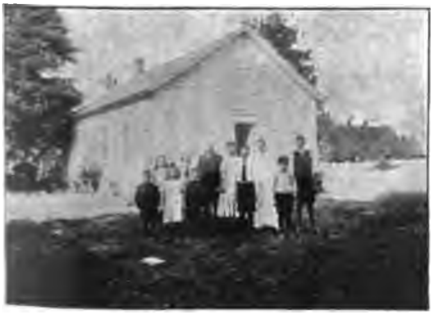

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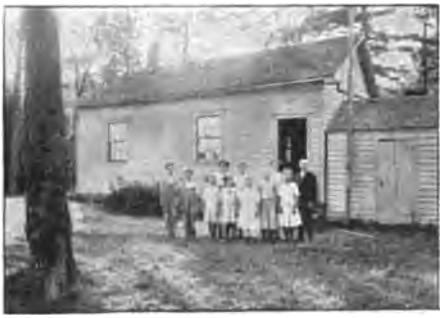

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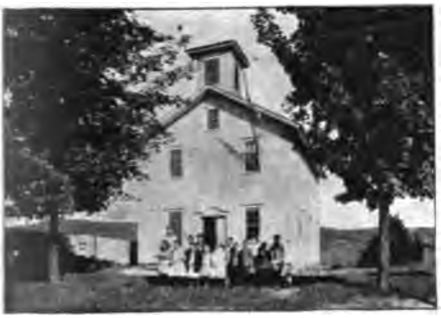
UNIV. OF

No. 10

No. 11

DANBY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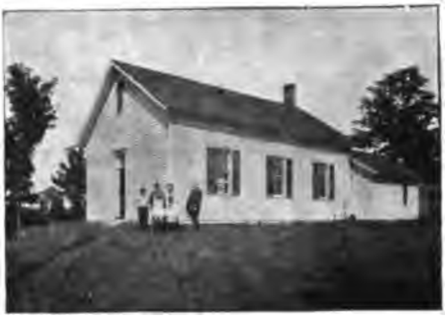
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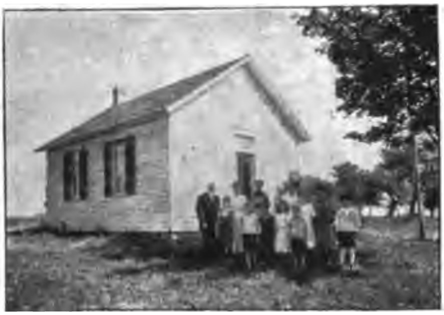
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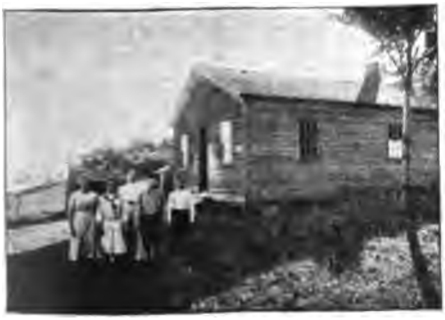
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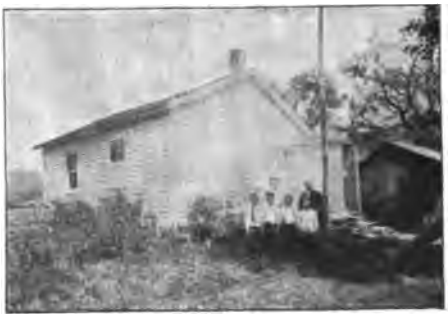
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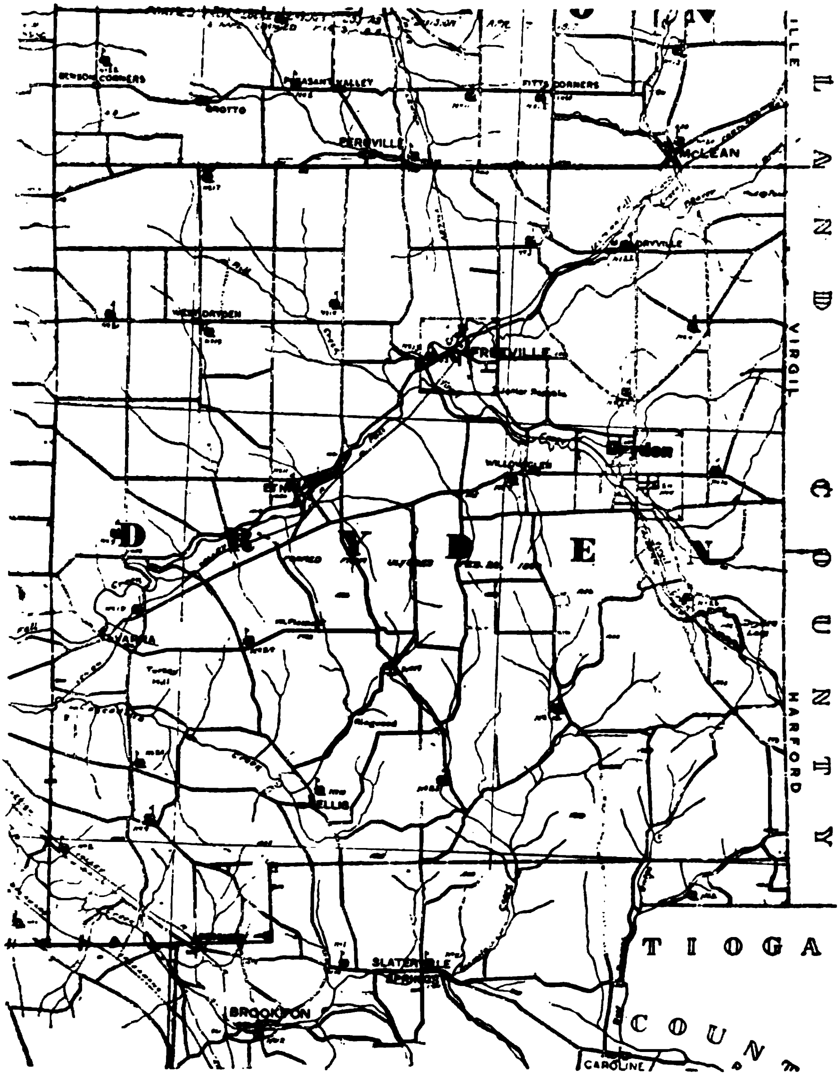


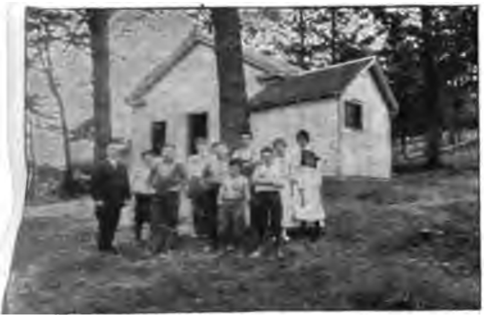
This picture represents a map of the town of Dryden. The schoolhouses are indicated as in the previous maps.

(A careful study of the map was made and the speaker pointed out how districts Nos. 4, 25, 7, 16 and 26 might readily be consolidated with Dryden; how Nos. 20, 9, 19, 23 and 24 might be consolidated with No. 8 at the village of Danby; and how Nos. 14, 17 and 21 might be consolidated with No. 15, etc.)

(The following pictures of the school buildings, teachers and children attending the schools in the town of Dryden were then placed on the screen.)

(The speaker then called attention to the small number of children who were found in nearly all of these one-room schools and contrasted the opportunities afforded such children with the greater opportunities and advantages afforded the children in the high-school districts in No. 13 and No. 8 through the association with other children, the more adequate courses of study, the better qualified teachers employed and the better school equipment. Comment was made on the larger outlook on life which the children obtained who were brought together in such large groups as those in attendance at school in these two high school districts, and the better opportunities and training which they were able to obtain in such schools through the use of suitable libraries, adequate apparatus and modern courses of study adapted to the special needs of girls as well as to the needs of boys.)

DRYDEN



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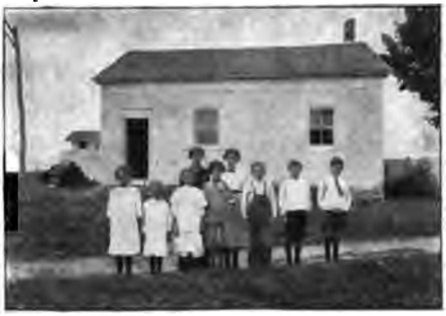

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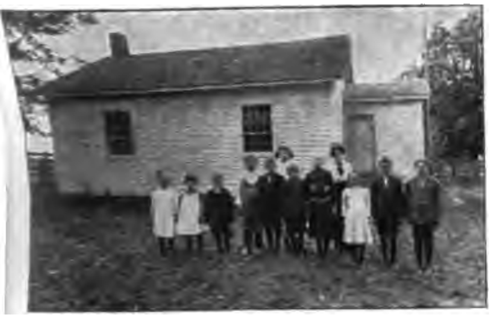

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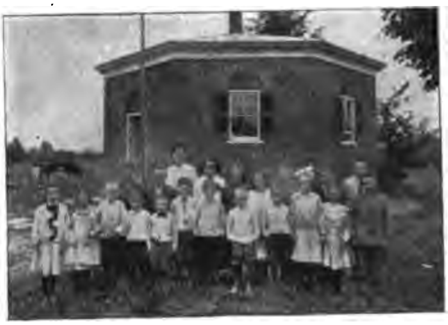

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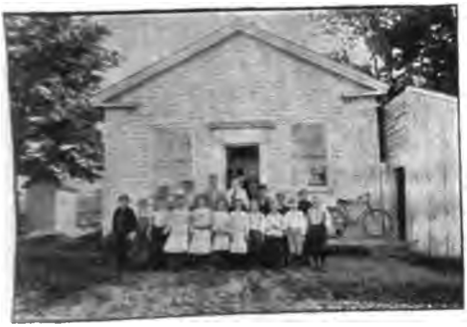

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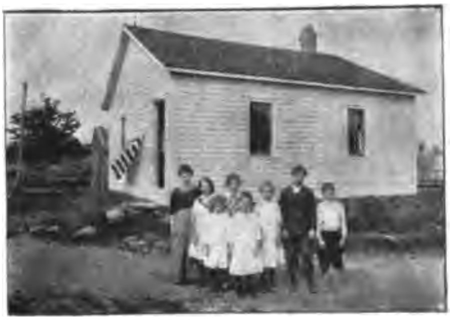


No. 9

UNIV. OF MIC

DRYDEN

No. 8.— High School

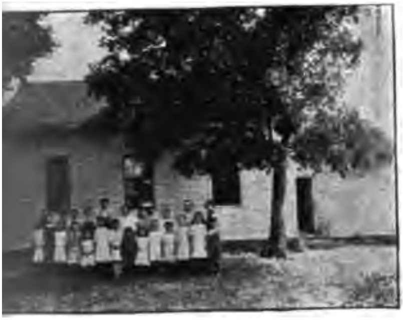
No. 8.— Pupils in Gymnasium

No. 8.— Domestic Science Department

No. 8.— Manual Training Class

UNIV. OF MICH.

DRYDEN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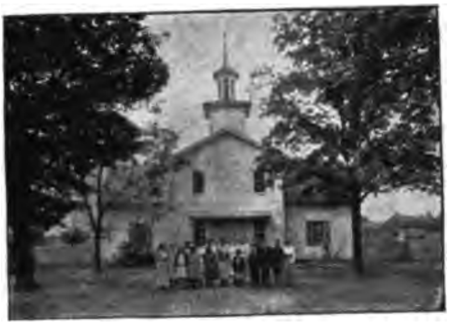
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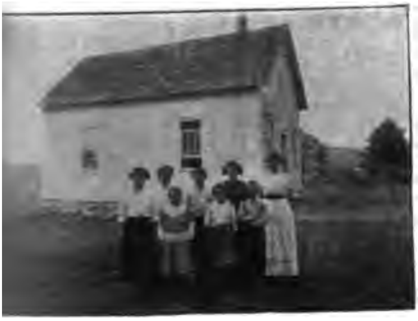
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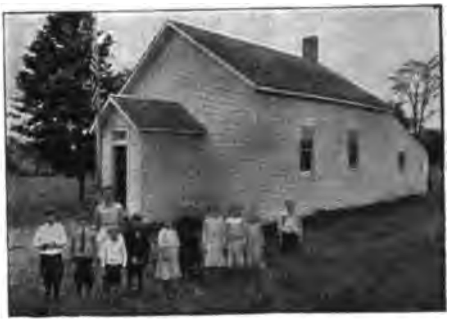
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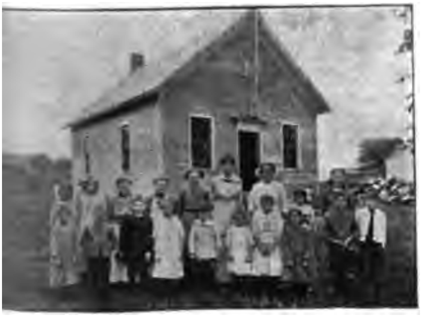
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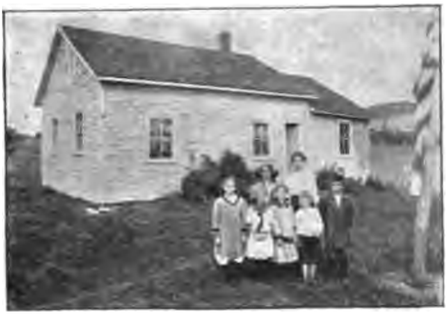
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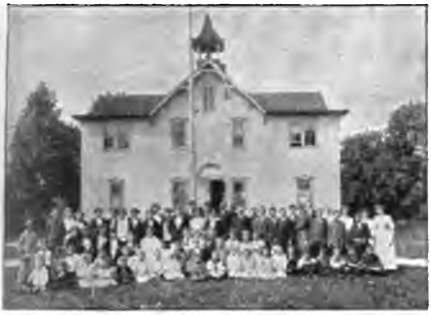
DRYDEN


No. 13.— High School

No. 13.— Intermediate Department

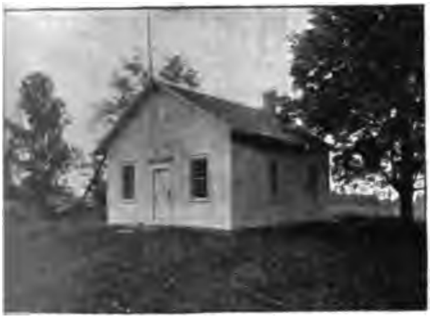
No. 13.— High School Laboratory

No. 13.— Study Hall

No. 13.— Library

No. 13.— Primary Department

DRYDEN



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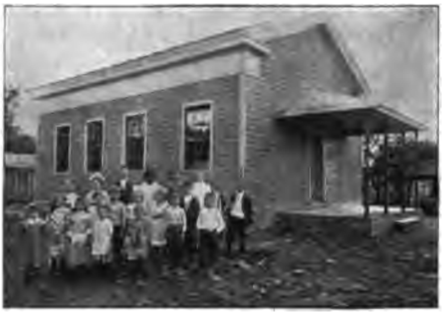

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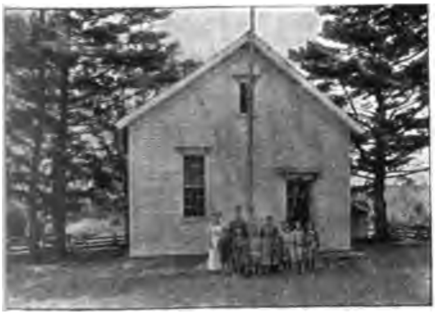

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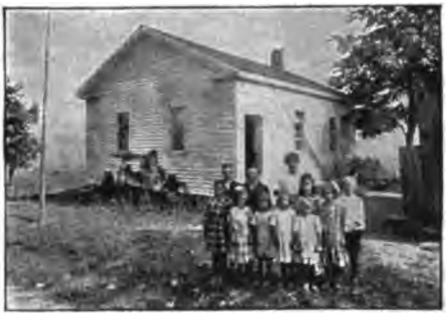

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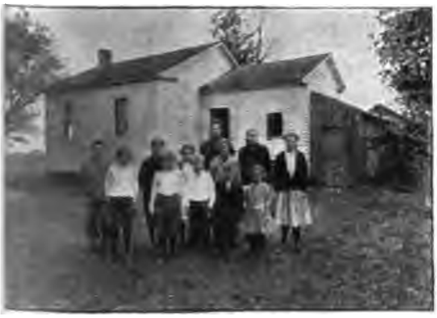

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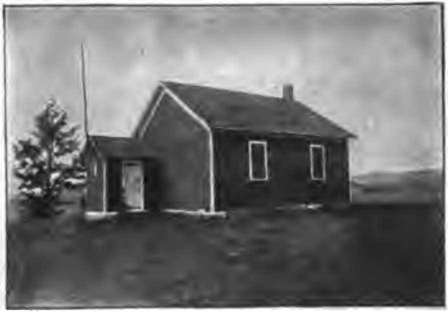

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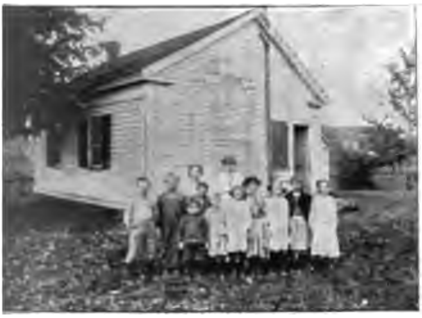
DRYDEN



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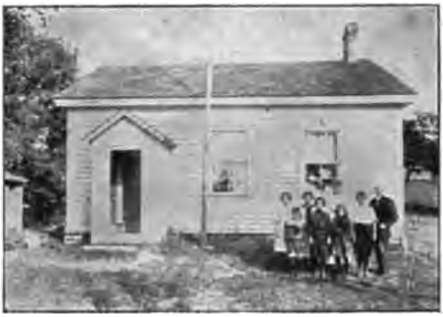

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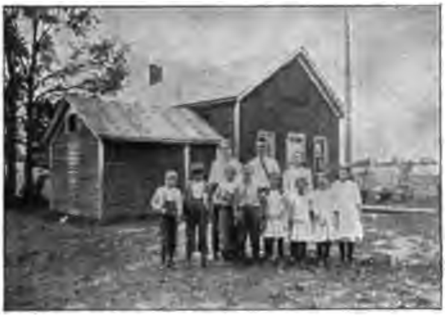

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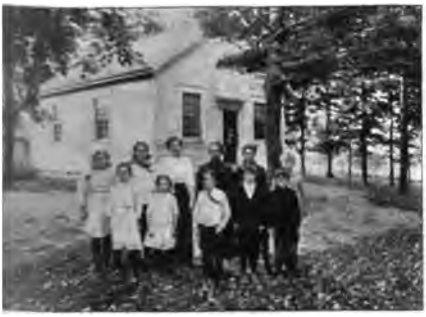

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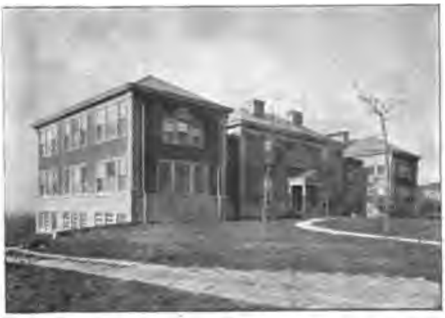


No. 27

(The following tables were then placed upon the screen and a special study and explanation of the same was outlined by the speaker. Attention was called to the difference in the assessed valuation of school districts, ranging from $16,500, in district No. 11, Caroline, to $118,830 in district No. 12, and $145,778 in district No. 21. In the town of Danby it was pointed out that the assessed valuation ranged from $16,706 in No. 1 to $109,328 in No. 8, and that in the town of Dryden the assessed valuation ranged from $32,588 in No. 24 to $397,692 in No. 8. Attention was also called to the difference in the number of pupils, ranging from 9 in district 11 to 75 in district 21; from 5 in district 15, Danby, to 41 in district 12; from 6 in district No. 24, Dryden, to 180 in No. 8. The small number of pupils in each of the districts having one-room schools was compared with the number in the village districts. Similar studies were made as to the cost per pupil based on average attendance in the three towns, and on the difference in the tax rate in the several districts which was necessary in order to maintain a school. It was shown that this inequality of taxation for school purposes meant an inequality of school opportunities.)

TOMPKINS COUNTY

TOWN OF CAROLINE		TOWN OF DANBY		TOWN OF DRYDEN	
District Number	Assessed Valuation	District Number	Assessed Valuation	District Number	Assessed Valuation
1	$59,900	1	$16,704	2	$144,525
2	27,055	2	45,994	3	80,790
3	36,370	3	24,970	4	65,827
4	29,100	4	47,320	5	89,426
6	43,624	5	45,488	7	125,332
7	48,642	6	59,661	8(H S)	397,692
9	31,675	7	17,281	9	47,799
11	16,500	8	109,328	10	60,310
12	119,830	9	51,705	11	160,995
13	66,650	10	52,980	12	50,388
14	30,000	11	34,285	13(H S)	195,014
15	24,375	12	93,063	14	66,242
16	70,767	13	26,392	15	54,652
17	45,665	14	19,810	16	54,186
18	84,048	15	21,540	17	56,133
19	71,939	16	33,623	18	93,158
21(H S)	145,778	Total	$700,144	19	33,977
Total	$951,918			20	63,457
				21	57,000
				22	36,123
				23	38,128
				24	32,588
				25	67,737
				26	102,080
				27(H S)	13,000
				Total	$2,186,559

TOMPKINS COUNTY

TOWN OF CAROLINE		
District Number	Pupils Registered	Average Attendance
1	15	8
2	17	12
3	19	13
4	18	11
6	16	14
7	40	28
9	13	9
11	11	9
12	62	39
13	28	21
14	10	6
15	20	12
16	12	10
17	13	7
18	24	18
19	9	5
21(H S)	75	58
Total	402	282

TOWN OF DANBY		
District Number	Pupils Registered	Average Attendance
1	10	5
2	15	11
3	Contract	
4	16	7
5	15	9
6	15	11
7	Contract	
8	37	25
9	10	6
10	16	12
11	8	6
12	41	32
13	5	3
14	12	7
15	5	5
16	10	7
Total	215	144

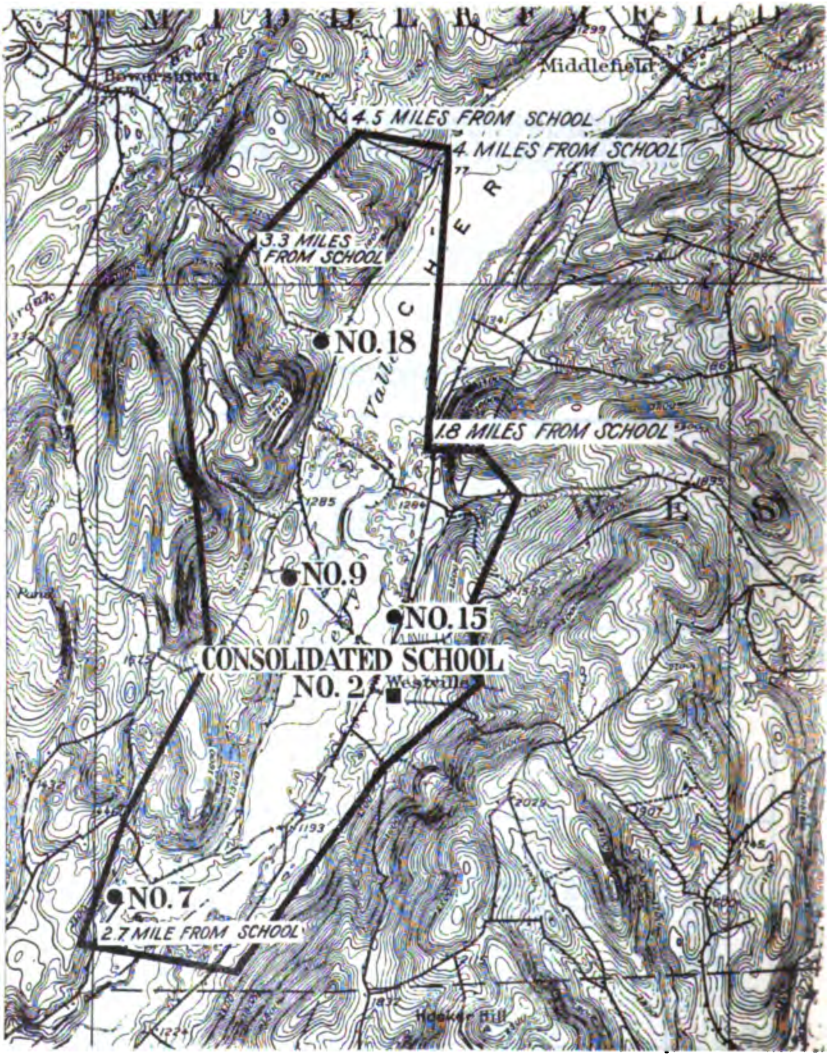
TOWN OF DRYDEN		
District Number	Pupils Registered	Average Attendance
2	20	14
3	10	7
4	12	9
5	28	21
7	25	17
8(H S)	180	144
9	12	7
10	29	21
11	27	22
12	14	10
13(H S)	119	80
14	16	10
15	20	14
16	7	5
17	10	6
18	32	17
19	12	10
20	10	7
21	10	9
22	Contract	
23	12	4
24	6	5
25	14	10
26	20	12
27(H S)	144	74
Total	789	Total 535

TOMPKINS COUNTY

TOWN OF CAROLINE		TOWN OF DANBY		TOWN OF DRYDEN	
District Number	Cost Per Pupil Based On Average Attendance	District Number	Cost Per Pupil Based On Average Attendance	District Number	Cost Per Pupil Based On Average Attendance
1	$44.61	1	$70.13	2	$35.77
2	36.50	2	38.07	3	58.45
3	30.68	3	Contract	4	50.61
4	36.60	4	62.35	5	28.74
6	26.06	5	47.02	7	25.80
7	17.59	6	35.30	8(H S)	52.12
9	64.12	7	Contract	9	62.11
11	42.63	8	27.60	10	23.34
12	29.86	9	69.22	11	42.82
13	24.52	10	41.13	12	39.58
14	67.35	11	55.47	13(H S)	41.23
15	33.34	12	25.68	14	40.38
16	46.38	13	124.31	15	29.34
17	58.39	14	54.64	16	77.65
18	24.27	15	82.70	17	74.79
19	84.69	16	55.60	18	38.52
21(H S)	39.31	Total Average	46.32	19	41.21
Total Average	35.15			20	67.90
				21	45.63
				22	Contract
				23	102.86
				24	98.52
				25	38.26
				26	40.63
				27(H S)	162.96
				Total Average	62.19

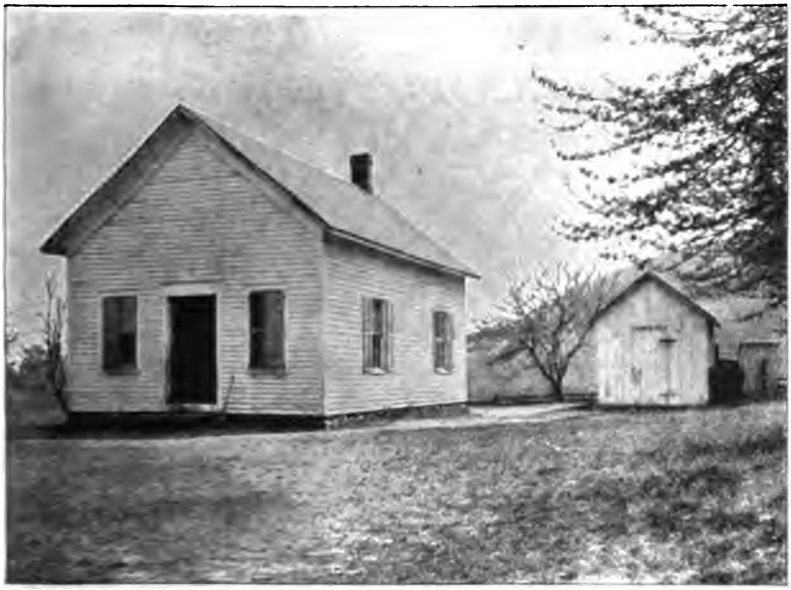
TOMPKINS COUNTY

TOWN OF CAROLINE		TOWN OF DANBY		TOWN OF DRYDEN	
District Number	Rate of Taxation	District Number	Rate of Taxation	District Number	Rate of Taxation
1	.040	1	.0100	2	.0025
2	.0102	2	.0104	3	.0040
3	.0065	3	Contract	4	.0043
4	.0063	4	.0060	5	.0056
6	.0050	5	.0060	7	.0024
7	.0062	6	.0040	8(H S)	.0116
9	.0126	7	Contract	9	.0050
11	.0112	8	.0042	10	.0050
12	.0074	9	.0060	11	.0035
13	.0055	10	.006	12	.0040
14	.0090	11	.005	13(H S)	.0123
15	.0090	12	.0073	14	.0038
16	.0047	13	.0076	15	.0046
17	.0050	14	.0098	16	.0040
18	.0036	15	.0114	17	.0045
19	.0042	16	.0055	18	.0050
21(H S)	.0093	Total Average	.0057	19	.0064
Total Average	.0067			20	.0045
				21	.0044
				22	.0044
				23	.0050
				24	.0090
				25	.0055
				26	.0031
				27(H S)	.0054
				Total Average	.0067

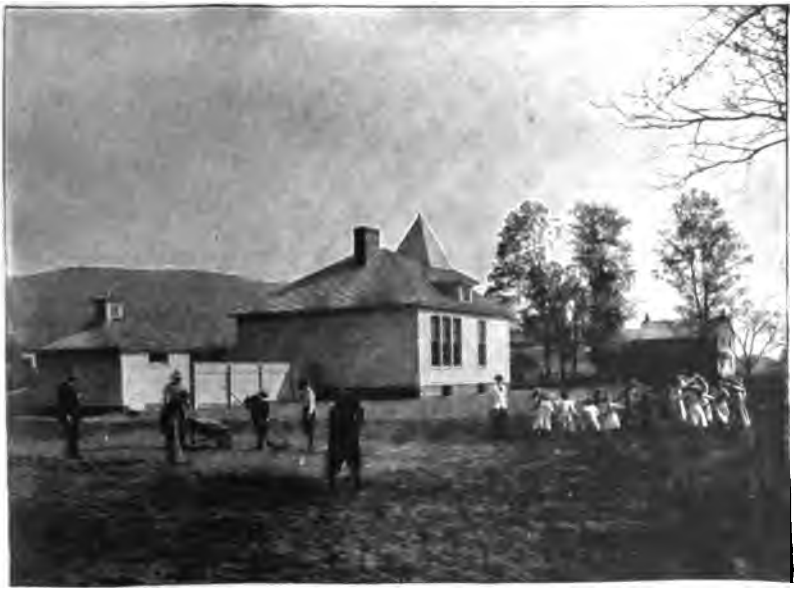


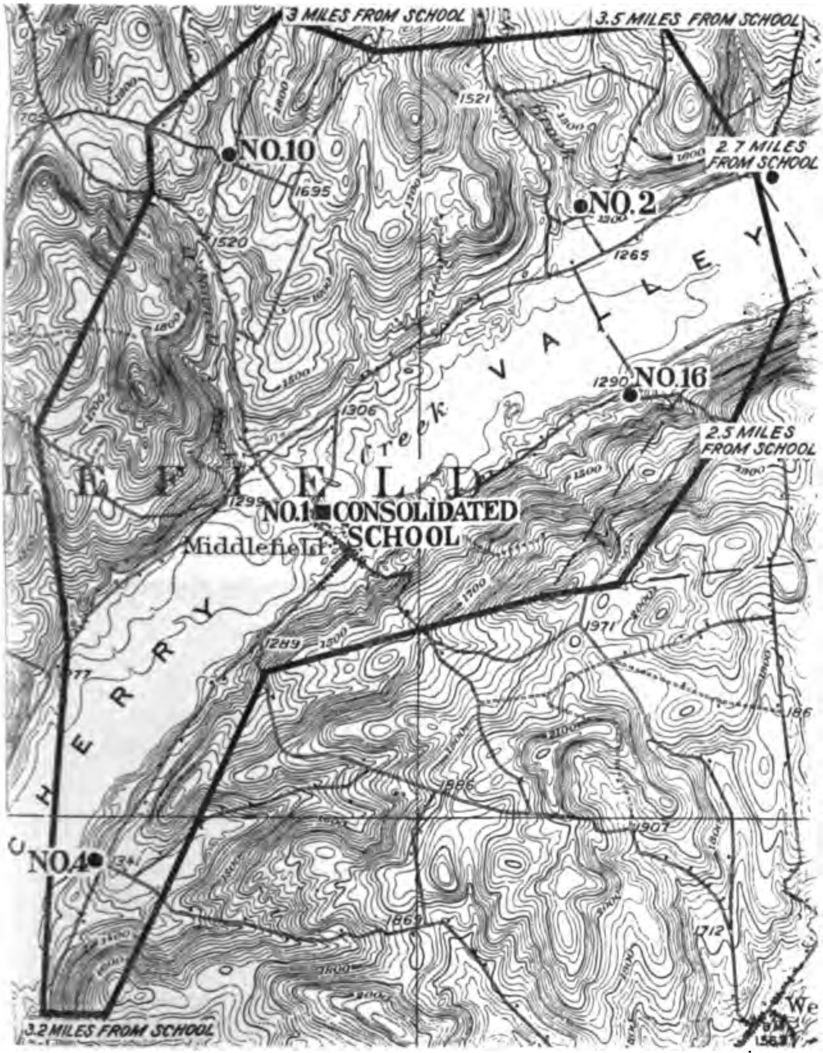
This is a view of one of the first consolidated school districts in the state under the act of 1913. School districts Nos 18, 9, 15 and 7 of the town of Middlefield, Otsego County, were consolidated by District Superintendent Cossaart into school district No 2 of that town, which is known as the Westville school. This consolidated district is located in a rich farming valley, and a stream extends through the valley.

There was, in each of these four districts, a school building undoubtedly built by the same contractor or carpenter, and like the following:



This is a picture of the new building which was authorized by the voters of the district after the consolidation.

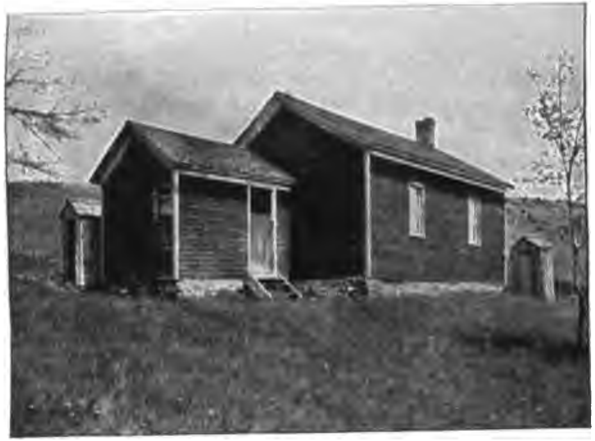




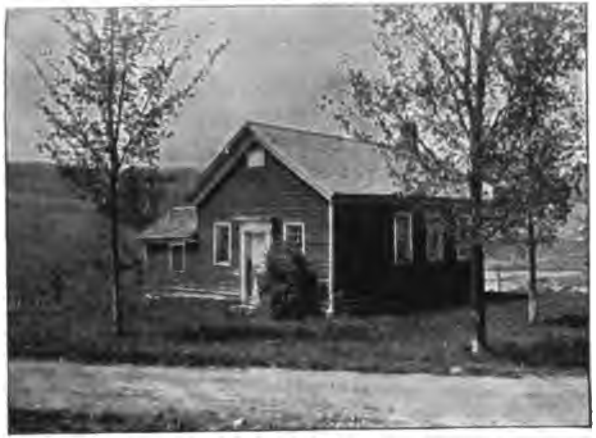
CONSOLIDATED SCHOOL DISTRICT NO. 1, MIDDLEFIELD.

Adjoining district No 2, Middlefield, in the same valley, is another consolidated district also organized by Superintendent Cossaart, in which districts Nos 2, 10, 4 and 16 were consolidated with No 1 at Middlefield.

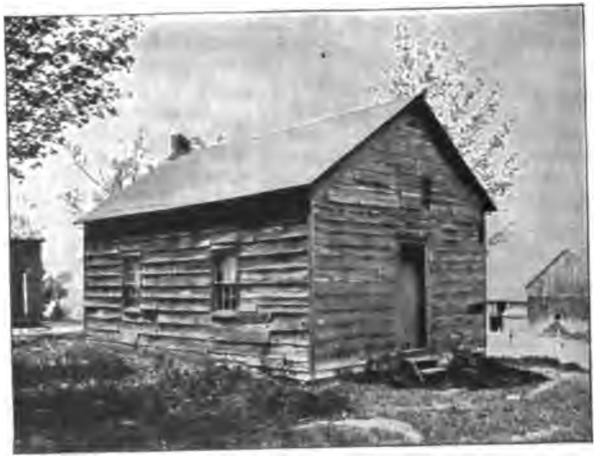
These are pictures of old buildings in three of the districts. The building in No 1 was remodelled and repaired and contains a large site so that it affords ample facilities for the children of the five districts.



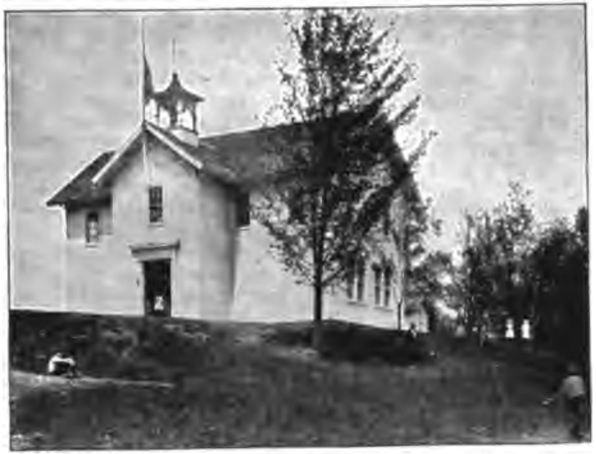
Formerly No. 2 Middlefield Merged in No. 1.



Formerly No. 10 Middlefield Merged in New No. 1



Formerly No. 16 Middlefield Merged in New No. 1



Consolidated School No. 1 Middlefield

UNIV. OF MICH.

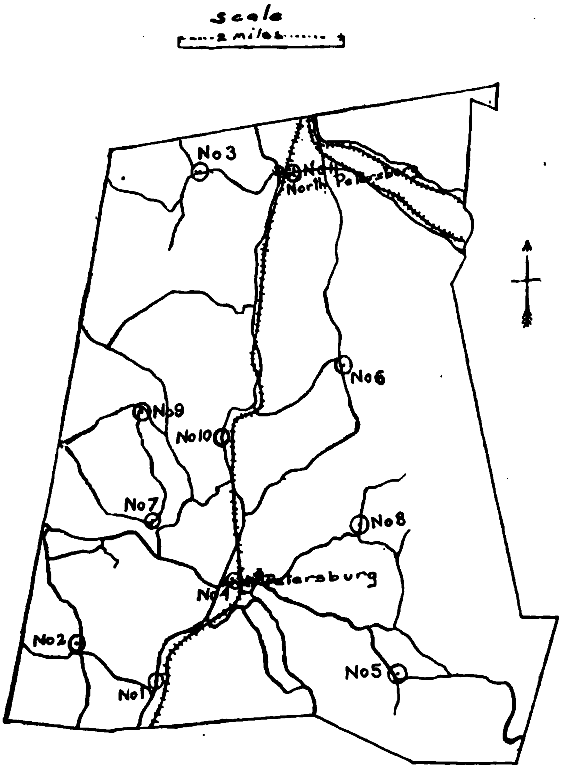
DATA SHOWING STATISTICS FOR EACH SEPARATE DISTRICT MAKING THE CONSOLIDATED DISTRICT

TOWN.	District number	Assessed valuation	Public money apportioned	Pupils enrolled	Average attendance	Cost per pupil based on enrollment	Cost per pupil based on average attendance	Total expenditures	Rate of taxation	Number of teachers	Transportation
Middlefield	1	$81,610	125	39	20	$11 74	$22 89	$457 84	.004	1	....
Middlefield	2	32,600	175	4	3	94 91	126 55	379 66	.006	1	....
Middlefield	4	20,800	175	12	9	36 72	48 98	440 84	.012	1	....
Middlefield	10	27,390	175	6	*	37 98	....	227 90	.002	....	....
Middlefield	16	16,675	200	6	*	33 33	....	200 00	....	....	....
Before consolidation, 1912–13	......	179,075	950	67	32	32 13	69 38	2,220 00	.007	3	....
After consolidation, 1913–14	......	177,780	1,050	52	38	46 17	63 19	2,401 06	.006	2	$720

* Contract.

(This table was represented on the screen and from it the speaker made a study and comparison of the schools maintained in separate districts with the one maintained in the consolidated district. It appeared that the total enrollment of the five schools was 67; that the average daily attendance was 32; that the assessed valuation of the several districts was $179,075; that the several districts received from the state $950. It was pointed out that in the separate districts the total enrollment of pupils was 67 while in the consolidated district the total enrollment was 52. The smaller number of children in the consolidated district was accounted for through the transfer of two or three farms from the consolidated district to another district as the school in that district was more accessible to the children on these farms. It was then shown that before consolidation the average attendence for these several districts was 32. This attendance, however, was based upon an enrollment of 67. The attendance appears to have been less than one-half. The average attendance after consolidation was 38 and based on an enrollment of only 52. It was therefore shown that in the consolidated district the average attendance was 73 per cent of the enrollment, while the average attendance when school was maintained in separate districts was only 47 per cent.

(A study was then made of the cost to maintain the school, and it appeared that the cost when separate schools were maintained was based on 67 pupils; that after consolidation the cost was based on 52 pupils, and the cost is therefore represented as being larger. The speaker stated, however, that the only fair basis of determining the cost of maintaining a school must be by computing the cost per pupil based on the average attendance of the children. It was shown that before consolidation the cost per pupil, based on average attendance, was $69.38, and since consolidation $63.19, or $6.19 less per pupil).



Town of Petersburg showing School Districts. ⊙No1

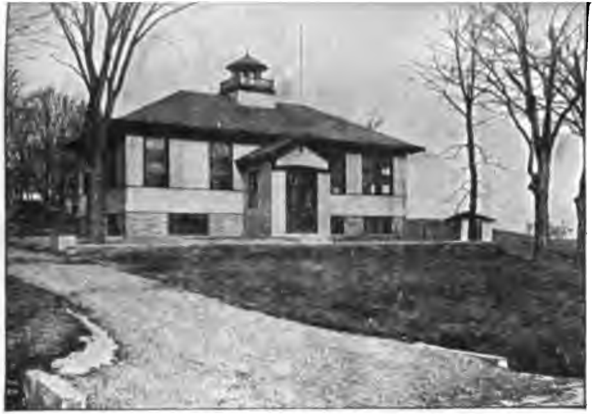
Railroads ++++++ Roadways ———

STATISTICS OF TOWN OF PETERSBURG

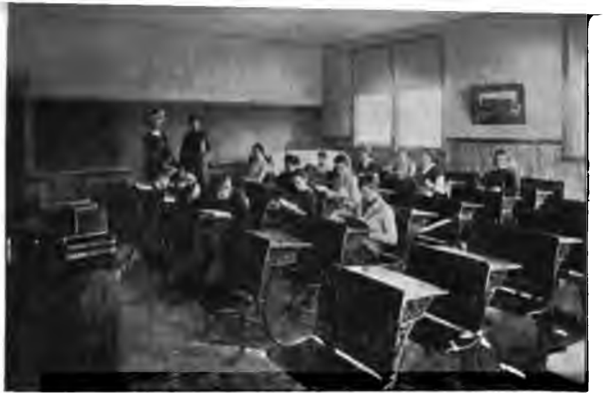
TOWN	District number	Assessed valuation	Public money apportioned	Pupils enrolled	Average attendance	Cost per pupil based on enrollment	Cost per pupil based on average attendance	Total expenditures	Rate of taxation	Number of teachers
Petersburg	1	$39,493	$175	27	9	$15 24	$45 73	$411 54	.0062	1
Petersburg	2	21,317	175	19	9	17 31	36 53	328 80	.0064	1
Petersburg	4	94,924	225	72	31	14 27	33 14	1,027 19	.0079	2
Petersburg	5	16,949	200	13	7	31 43	58 38	408 64	.0120	1
Petersburg	6	181,508	125	29	8	16 38	59 38	475 02	.0019	1
Petersburg	7	19,527	200	14	7	27 97	55 94	391 61	.0095	1
Petersburg	8	7,475	200	7	3	54 54	127 26	381 77	.0243	1
Petersburg	9	11,910	200	19	4	22 42	106 51	426 02	.0185	1
Petersburg	10	62,912	125	22	5	17 89	78 70	393 51	.0041	1
Total	....	$456,015	$1,625	222	83	$19 12	$51 13	$4,244 10	.0056	10

The foregoing map speaks for itself and shows how district
the village of Petersburg is so located that several districts ad
ing it might well be consolidated with it. It will be observed
Nos. 1, 2, 7, 8 and 5 could readily be consolidated with N
and that districts Nos. 9, 10 and 6 might also be consolidated
No. 4. The highway following the railroad north and s
through the town is a state road and the highway leading f
the village of Petersburg, and extending west therefrom, is
a state road. All the highways in this town are good hard ro
in good condition, and much traveled. The distance from an
these schools to the Petersburg school is not prohibitive for s
children. It will be observed that the enrollment in each of t
schools is from seven in No. 8 to seventy-two in No. 4. No.
the village district, and the largest attendance in any of the o
districts is 29. The total number of pupils enrolled in these
tricts is 222, but the average attendance for all the districts
year was but 83. Only about one-third of the children enrolle
all of these schools were in daily attendance. The inequalit
taxation is emphasized by this table. It will be observed
the cost per pupil based on enrollment varies from $14.2
No. 4 to $54.54 in No. 8, and that the cost per pupil based on
average attendance varies from $33.14 in district No. 4 to $12
in No. 8. Attention is also directed to the assessed valuatio
these districts. No. 8 has an assessed valuation of only $7,
We all know that it is impossible to maintain the proper
of a school on an assessed valuation of this amount without mal
the taxation burdensome for the people. The valuation of
trict No. 9 is a little less than $12,000, No. 7, $20,000, and N
$17,000; while No. 6, with only 29 pupils to educate, ha
assessed valuation of nearly $182,000. In other words, dis
No. 6 has more than one-third of the assessed valuation of
nine districts of the town.

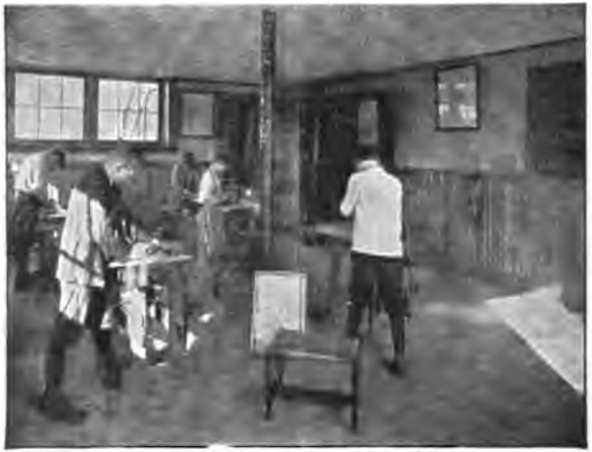
It would be possible, if these schools were consolidated so
these 222 pupils could be brought to one school, to organi
well-graded school and maintain not only the usual eight y
of elementary school work but also an academic course.
could be done without employing more teachers than are
employed in the separate schools. These districts received



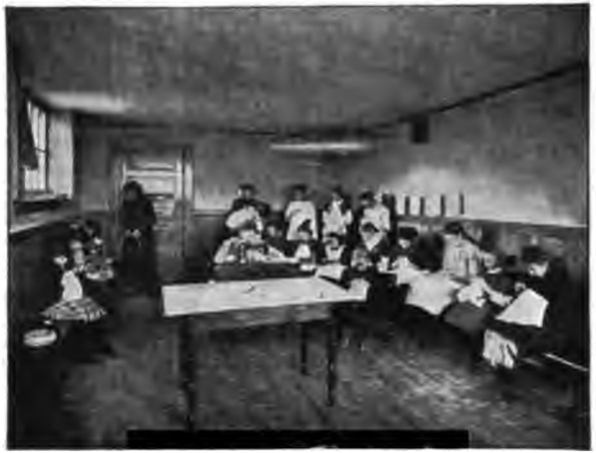
CAMILLUS No. 3 (Onondaga County)



SEVENTH AND EIGHTH GRADE — CAMILLUS No. 3



BENCH WORK — CAMILLUS No. 3



SEWING CLASS — CAMILLUS No. 3

UNIV. OF MICH.

No. 3. **Bedford** (Westchester County)

Interior of School

Domestic Science Room

5 of public money. If they were consolidated into one ch district might receive a greater amount of state hese schools are located in a fine agricultural section, ricultural course might well be maintained in such principal could be chosen who is qualified to supervise ural course, and in such event, if the district paid the 31,200, it would receive $800 additional funds from The district would also be entitled to receive addi- ls for the academic department, amounting to $200. t would also be entitled to a further sum of $900 in iotas, so that the total amount which the district would m the state would be $3,525. This amount nearly entire amount which was paid by the several districts ' salaries last year. There would be brought to the this district property having an assessed valuation of

d also be borne in mind that there are many young the territory embraced in these several districts who eprived of high school privileges, but who would be tain such educational privileges if all these districts ized into a central school at Petersburg. There are ple in this community who travel to adjoining high d the aggregate amount expended by them in traveling, etc., is a considerable item and should receive consider- etermining the expense of maintaining these schools.

to show you some views of modern school buildings. ng in this district is a two-room building located at Onondaga County, and in a rich farming section. The luation of the district is one-half million dollars. The room is the equal of the best recitation rooms to be hools in cities and villages. You will observe the boys the manual training room in the basement of the build- site this room is a similar room in which the girls re- ng in domestic art.

ures directly following show a modern school building rd, Westchester County, and two interior views. You e that one room is fitted for home work and domestic or the benefit of the girls.

I am showing these pictures for the purpose of illustrati possibility of doing these things in the country schools just as they may be done in the schools of cities and villages.

The following pictures show the activities of the agricultu partment of the school at Highland. In one picture the b taking notes at a lecture and in another they are sorting and putting them in shape for market. You will also obser the girls are doing the work required in the courses of d science and domestic art; again, that the boys are receivi sons in practical spraying, sharpening tools, trimming or etc. This is the type of work which should be done in rural schools upon this basis, and to maintain equipment, t and courses of study to meet this demand.

Boys Taking Notes at Lecture

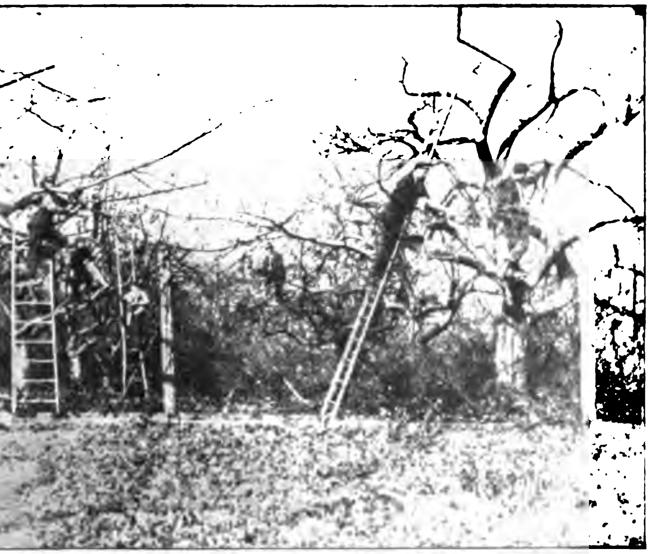
Sorting Apples

MESTIC SCIENCE AND DOMESTIC ARTS DEPARTMENT

LESSONS IN PRACTICAL SPRAYING

UNIV. OF MICH.

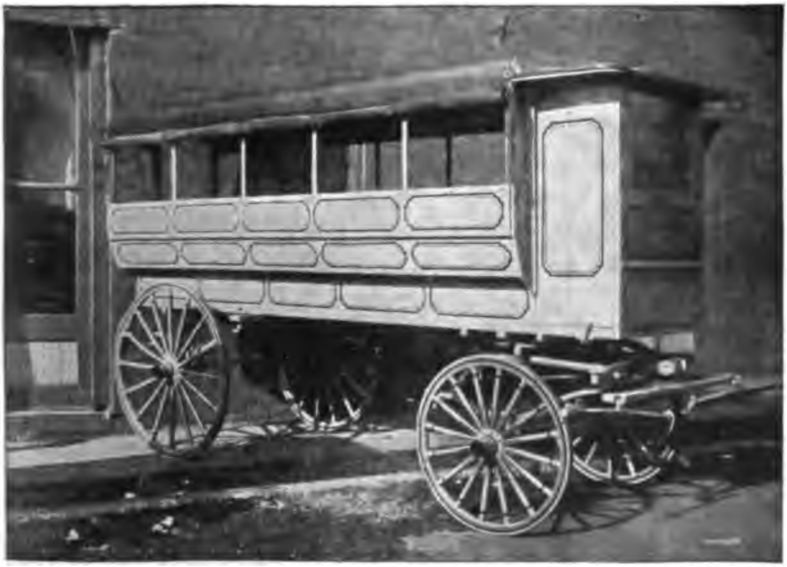
Boys Sharpening Tools



Instruction in Trimming Orchards

UNIV. OF MICH.

THIS PICTURE SHOWS A GOOD LIBRARY IN A RURAL DISTRICT



THIS IS A TYPICAL WAGON USED IN STATES WHERE THE TRANSPORTATION OF SCHOOL CHILDREN IS MADE A REGULAR BUSINESS.

clusion I desire to say that if the township system were and one board of education were in charge of all the f a town, we should soon have a consolidated system of hroughout the entire state. The principal advantages ıuld be achieved under this plan of school administration ummarized as follows:

present unit of administration is so small, and the ıent of the usual district school regarded as a matter of importance, that the best men and women of a com-vill often decline to serve as trustees. If the manage-country schools were raised to a higher plane, and the ortance of the school to the community could be more emphasized, men and women of the greatest education ıre and the widest business experience in a community attracted to the position, and would not only be willing ous of serving in such capacity. The general manage-the educational interests of a whole town, which would rom ten to thirty schools as now organized, by a board vould exalt and dignify the importance of the office of ustee and would emphasize the work of the school so ard of the type above described would be chosen.

cing the schools of an entire town under the general ıent of a single board of five persons chosen by the voters ıwn, who possess the qualifications now required to be o vote at school district meetings, would result in giving proposition involving an expenditure of funds active, and businesslike consideration. The great waste re-rom unnecessary expenditures and careless management rvision of school funds would cease.

maintenance of unnecessary schools would be discon-These schools would be consolidated with other schools. ple chosen by the voters of a town, and each one inter-ıll the affairs of the town, could be trusted to determine ools might be discontinued to the advantage of educa-all other interests of the town. No one need fear that thus chosen and composed would close a school when on would be the means of prohibiting children from school because of the distance to travel.

4. The unit of taxation would be the town. Taxatio school purposes would then be equalized. All the propert town would pay its proportionate and equal share for the tenance of schools in the entire town. The burdens whic unjustly borne by more than one-half of the schools distri the state would be removed. Large corporate interests now pay taxes toward the maintenance of a single school pay their proper share for the maintenance of all the school town.

5. Schools maintained under such management would p educational facilities in the country districts which would equal of the educational advantages afforded by the schools tained in the cities. Many things must be done in conn with the country schools before this result may be accompl Such result will never be achieved until all the interest agencies of a much larger unit than the present school distr and this unit is preferably the town — are brought togetl harmonious action, and the people appreciate the possibilit this cooperation.

6. It is impossible to properly grade small schools under present organization. With nearly 4,000 schools havin average daily attendance of less than ten, the impossibil grading such schools will be readily recognized. In thou of others the enrollment is twenty-five to thirty-five. In schools every one of the eight elementary grades is repre and often there are pupils taking advanced subjects. teacher must do all this work with the result that not more ten minutes on the average is given to a recitation, and ofte In the graded schools of the cities and villages from thi forty minutes are given to a recitation. The disadvantage pupil in the rural school is too obvious to need description.

7. With the greater number of pupils brought together a basis of taxation equalized and enlarged, sufficient teachers be employed so that the schools might be graded and the in tion adapted to the ages of the pupils, and be made as li comprehensive and efficient as the instruction generally pr in the schools of the cities and villages.

r such conditions courses of instruction could be pro-
h would be adapted to the needs of our agricultural
es. These courses could be enriched and made as
n the intellectual and cultural standpoint as courses of
in the populous centers. It would also be possible to
ourses of study which would contribute to the needs of
e of agricultural development and interest in the state.
ols could then be made the great laboratories of every
ecessity of the state.

ation ago the boy on the farm found it profitable to
ol during the winter months from the time he became
til he attained his majority. Boys of this age are no
nd in the rural schools. They now rarely seek the
h school when the usual fall work on the farm is com-
November. Courses of study are now generally ar-
that all pupils must enter school at the beginning of the
ptember. If our rural schools were organized on the
h I have outlined in this discussion it would be feasible
e special courses for the boys of sixteen or more who
in at work on the farm until late in the fall or the
of winter, and who must return to such work in early
Courses of this type extending over several winters
possible and would be of inestimable value. Courses
prepared to meet the needs of girls as shown in some
s which have been presented would be provided.

-school facilities could be provided throughout the
ctions. Central schools of academic grade might be
d in many centers. These schools would be within
of many of the children between the ages of 12 and 18
leave home Monday morning and remain until Friday
onsiderable expense in order to enjoy such privileges.
hools were established the young people would be pro-
ome with the educational advantages which they must
away from home, and they would also be afforded the
, influence and protection which exists in every good

npetent teachers might then be employed in these
Teachers who possess qualifications which are the

equivalent of teachers who are employed in the schools of cities and villages. Six thousand teachers, one-half of those employed in the rural schools of the state today, who have had no educational advantages beyond the elementary school, and who have had no professional training, would be compelled to give way to efficient, trained teachers. The state could establish institutions for the training of teachers with courses of study based upon the economic, industrial and sociological conditions of our rural life.

11. Schools would be maintained for the same period of time in the country districts that they are now maintained in the cities and villages. The children in the rural schools who have one month less of school than the children of the cities are not given an equal opportunity with the city children. Vacation schools could also be established.

12. A system of libaries, meeting the intellectual needs of every citizen of the town, could then be maintained. Lecture courses might also be established. These two agencies could be made a tremendous power in promoting the common enlightenment of the people of all our rural communities.

13. The enforcement of the compulsory attendance law and the medical inspection law could be made more effective.

14. The recreational and social interests of the people could be properly organized and administered. Play is as essential as study in the moral and intellectual development and growth of a child. It is as important that children shall have wholesome recreation as it is that they shall have efficient classroom instruction. It is impossible in many rural communities for the boys to enjoy a game of baseball without becoming trespassers. There should be, under the control of the school authorities in every town, ample grounds to afford the usual outdoor sports and games in which young people generally desire to participate.

15. The people of an entire town would be brought closer together in a community of interests. The spirit of cooperation would be fostered not only in educational but in all other activities in which they had a common interest. To the rural communities might be restored much of the prestige and leadership in intellectual, social and political matters which such communities possessed a half-century ago. Within a decade the influence

reorganization of our rural life would be felt in the life ion.

SHART: It is a little unfortunate for our evening ses- the Memorial Service for Ex-speaker and Ex-congress- in A. Merritt should have been set for this evening in bly Chamber. I understand that there is quite a little in favor of adjourning our meeting this evening in the memory of Mr. Merritt. If this is done, and we part of the program for this evening on this afternoon, alance tomorrow, it would accommodate every one inter- such is the opinion of the people here, I move you that adjourn we do so until tomorrow morning at 9:30 and meeting this evening.

RESIDENT: Is there anything to be said on this subject?

SSON: Only this. In view of the fact that we have ded the privileges of the Capitol in recent years, and f the prominence of my old-time friend and fellow- my county — speaking for myself personally — I think e eminently fitting that we omit our evening session in e Chamber and show our respect to the State Govern- h honors the memory of Mr. Merritt in the Assembly tonight.

carried.

R BARNABAS: Owing to the change in the program, I should give our invited guests who were on the program evening the preference on the program for tomorrow

RESIDENT: That suggestion will be adopted with the of all of the members. Since our convention last year active members has been called to a very high and im- tional service. He was on committee service at the time tion and the program committee was a little embarrassed st what to do with him. We did not think that we ought n to continue to serve this association in view of the work that he had before him, but we remembered the ned statesman who left his plow, established a nation ed to the farm, and so the man whom you have honored comes here this afternoon to honor us in the position to which we had previously assigned him. I cannot introduce him to you because he is well known to you all, but it is a privilege and a pleasure to announce Hon. James W. Wadsworth, United States Senator-elect.

REPORT OF THE COMMITTEE ON THE DEVELOPMENT OF AGRICULTURAL RESOURCES

JAMES W. WADSWORTH, JR.

The President has been most generous in his introduction of me to this gathering. As a matter of fact, Mr. President, I come here with an humble apology to express to you and the officers and members of this society. For the past year I have had the distinguished honor of being named as chairman of the Committee on the Development of Agricultural Resources. Last year — I served on it at that time — we endeavored to present a report and finally did so. I have been planning for some weeks to meet with that committee again to discuss matters which are of intense interest to us all, and perhaps present a report which would receive the careful consideration and discussion of this body. Unfortunately, two months ago I made an engagement which kept me away from the city of Albany last night and another which will take me to the city of New York for tomorrow night; and very recently, as you probably understand, I was invited to say something on the life and character of my dear friend, Mr. Merritt, in the Assembly Chamber this evening. So I desire to apologize for my inability to perform the functions of chairman of the Committee on the Development of Agricultural Resources.

You have said something as to your doubt whether you should call on me for assistance. Let me say, that you should do so on every occasion when I can be of service. Perhaps it will not be amiss for me to give some explanation and, in view of the fact that I shall be unable to personally present a report for the committee, to recall to the minds of the members of this association one or two matters we recommended for your consideration last year.

Last year your Committee on the Development of Agricultural

Resources had something to recommend with respect to the taking of an agricultural survey of the state of New York, and the society was kind enough to express its approval of our recommendation at that time. Speaking for myself, and without any authority to speak for the committee, I want to express here the hope that the time will come when the government of the state of New York, through its proper authorities trained for that kind of work, will, by surveys of the agricultural resources of the state and examination into the social conditions existing in the country districts, including the great problem of education, gather together by that means a mass of information upon which agricultural legislation can be intelligently based for the future. Every legislature that comes to Albany is filled with the idea and the desire to do something to aid agriculture and the people of the agricultural districts, knowing well that the prosperity of this industry and the prosperity of these people will always be the backbone of any self governing country. The trouble has been that the efforts have been scattered, that there has been no system in the development of our agricultural legislation, due to the fact that in years gone by the legislatures have not had at hand complete information as to what conditions existed; and they never will have that information until something along the line of this survey which we proposed last year shall be undertaken, and in course of time completed by the proper authorities of the state. That was one of the topics I desired to bring to your attention.

The only other topic I desire to touch upon is one which perhaps you think I indulge in as a hobby. We ought to take into consideration the condition of the meat supply of the United States, and, as citizens of New York — with its remarkable pasture grass, its ability to raise stock feed of nearly every kind and description that can be raised in a temperate climate — turn our attention to the development of the meat supply in the state of New York. Ten years ago such a suggestion could not be taken seriously because the prices of beef and of beef animals were approximately forty to fifty per cent. of what they are today. This state is the greatest dairy state in the Union, which indicates that we are capable of raising live stock. In view of our varied crops which afford proper food for the purpose, and in view of the tremendous prices which are now being obtained for beef, it has occurred to me more than once that it would be profitable for the man who owns thirty, forty, fifty or sixty dairy cows to turn some attention to what might be termed the raising of "baby beef."

As an illustration of the situation as it exists all over this continent, permit me to recite to you very briefly the results of observations which I have made in the Pan-Handle section of Texas during the last five years. Six years ago a three-year old steer of a beef breed, raised on the open range, sold by contract by the carload, would average anywhere from $28 to $30. This year the property with which I have been connected during the last five year, sold five-month-old steer calves for $30 a head — three thousand of them. Not one of these calves would weigh over four hundred pounds; if they averaged three hundred and fifty they are doing well for a range-bred calf. It occurs to me that if in a country like that, where fifteen acres of grass, on the average, are required to support an animal, it can bring $30, here in the state of New York, where two or three acres of grass will support an animal, and where the raising of a calf — particularly in a dairy section — can be accomplished very largely as a by-product, it is well worth our while to consider whether New York dairymen should not attempt something along the line of beef raising.

Apparently there is no prospect for any considerable increase in the meat supply of the United States. The great herds of the West are gradually dwindling, and the time will come, if we are to continue our habits as a meat-eating nation — and we are the greatest meat eaters in the world — when the consumers in the great cities who are now clamoring against the high cost of the various food products, including meat, must depend upon the farmer of the East and Middle West to raise a few steer calves or heifer calves each year as a part of his general business. For, if we are unable to obtain a supply from such a source, within ten years we shall have ceased to eat meat at the rate we eat it now. I think your committee last year ventured to suggest, along this line, that the State Fair Commission take up this matter and

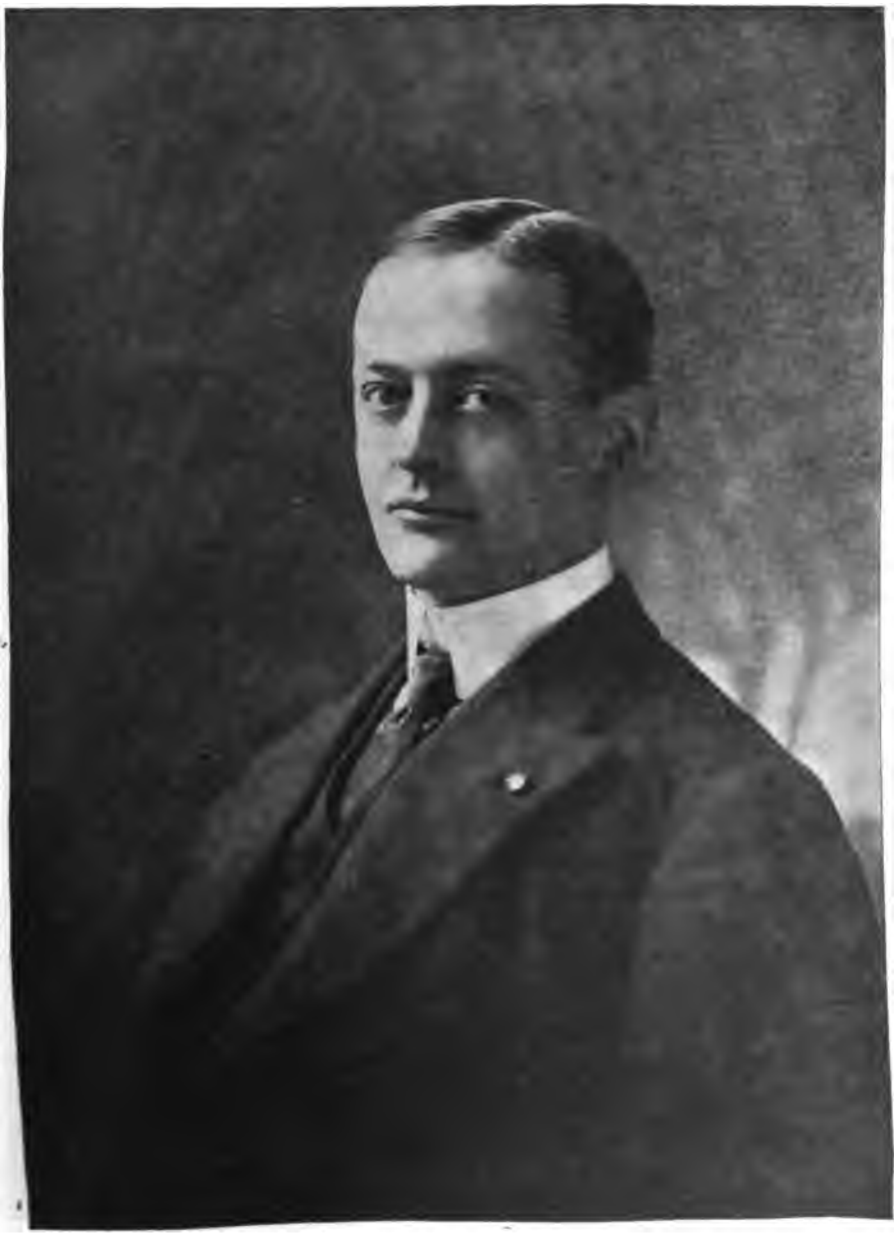


FIG. 486.— JAMES W. WADSWORTH, JR., CHAIRMAN OF COMMITTEE ON DEVELOPMENT OF AGRICULTURAL RESOURCES

xhibits of that kind of product might not be properly held tate Fair at Syracuse as an educational method of showing ners of New York that an opportunity lies ready, which, udgment of some of us, should be taken advantage of.

President, I have nothing more of interest to say, if indeed accomplished even that. I desire to thank you and the s of the association for the opportunity to appear at this ır and consume so much of your time.

ANNUAL ADDRESS OF THE PRESIDENT

JOHN J. DILLON

seventy-five years continuous service to agriculture, we stly indulge in a pride in the past achievements of the ork State Agricultural Society, and in the distinguished ho have shaped its destinies and directed its helpful es.

much this society is responsible for the growth and prosf our agricultural resources no man can express in definite We only know that it led in every movement for agriimprovement. It was a pioneer in the field of agrieducation. It organized and directed the State Fair o recent years. It originated the farm institute service tate, and conducted meetings successfully for a number of It inspired the original state function, which later deinto our now extensive Department of Agriculture. er with this service to agriculture, it joined hands with vorthy enterprise in the development of the resources of e.

not my purpose to speak in detail of the individual service men who in the past directed the influence of this society ıfully and so well. In the early struggles of the society safely conclude that its resources were no more abundant ey have been in recent times. Some among us yet rer the desperate struggle of our predecessors to make both eet financially; and some of us know that heavy personal ibility was often assumed to maintain the service and the ns of the society. They worked without pay or reward; at times without recognition or credit. They gave not only of their means, but they made the greatest of all sacrifices — they gave of themselves for the cause of an industry upon which depended the comforts and perpetuity of mankind. In all it is an edification to us to know that no scandal ever blighted a single promise in these seventy-five years of succession; and that not one dollar of the funds of the society was ever under suspicion of finding its way to an improper use. My memory does not go back to the first quarter of a century of the society's existence. I did not even enjoy the personal acquaintance of all the men in control of its affairs in more recent years; but I know something of the life of James S. Wadsworth, of John Delafield, of Ezra Cornell, of Patrick Barry and of Horatio Seymour, and I know that such men could not fail to leave the impress of their lives on the cause that they served.

If the record of distinguished men of the distant past seems mystic to the present generation, we find present inspiration and counsel in the fruitful and mature lives of men who are yet with us. I take it that the heart of every member of this society swells with pride at the mention of James Wood, of I. P. Roberts, of Benjamin F. Tracy, of Gilbert Tucker and of James S. Woodard.

To me these men have consecrated our records by their wise and disinterested service, and they have hallowed the atmosphere of our conventions by their benedictions on our deliberations and on our work.

Rich as the New York State Agricultural Society is in traditions of the past, at no time in its history has it rendered greater service to agriculture than during the period of its activities since 1911. The discussion during these recent years crystallized during 1914 into measures of the greatest importance to the people of the entire state.

At its annual convention in 1911 this association pledged itself to the principles of cooperation in the promotion of farm credits, and in the marketing of farm products. Through its influence and the activity of its members, a statute was enacted at the last session of the legislature authorizing the creation of a system of cooperative farm and home credits in the state of New York. This system is now being developed. A central institution, to be as the land bank of the state of New York, has been zed with $100,000 of capital stock subscribed. This capital being paid in, and the bank will be open for business a few days, or weeks at most. This system imposes no al burden whatever on the state. It is, however, subject inspection, the cost of which is chargeable to itself. This New York State in the lead in this important departure efying and standardizing farm mortgage credits, and in l more important feature of the amortization of mortgage The system adopted was necessarily a compromise of nt minds and interests. Experience may show that it needs evision to adapt it to the needs of all the people of the state. it will only follow the custom of new legislation generally. operative principle is maintained in the system. Under it, is encouraged, ample credit is provided, safety is abso- secured and the public spirit of the neighborhood is afforded for the development of local enterprise.

ome respects New York State has suffered from an over- of advantages. Our soil is diversified and fertile. Our s are abundant. Our facilities for transportation and nication are ample. Our markets are practically at our We have within easy reach every possible means of edu- improvement and entertainment. But we have been l and wasteful of our gifts. Lulled by the apparent y of our advantages, we have stood by while men of less- sections, through superior methods in packing and ing, established their products in the market at our very While products from other states and other countries are our local markets in all parts of the state, our producers een frantically and carelessly glutting the metropolitan s with products of good, bad and indifferent grades all in ıp. Oftentimes his own or similar goods are returned to mer's neighboring town for less than it would cost him to d deliver them.

instruments of distribution have passed into the hands of anization of distributors and speculators who take advan- the periodic glut of the markets to depress prices without way giving the consumer the benefit of the reduction the producer is obliged to make. No matter how violently the wholesale market may fluctuate, the retail prices to consumers remain at the old high level. The producer is even deprived of the advantage he might gain from an increased consumption of the goods he sells for less than the cost of production.

Under these conditions a bumper crop often leaves the producers with a less total income than they would receive from a small yield. Through a bad system of distribution the farmer is punished for producing a large crop. In many instances he has done the natural thing, and ceased to produce, and we have the spectacle of hunger and want in the cities, while within two hours' ride the finest food in the world is rotting on the ground.

In the meantime students of statistics have become alarmed at the flow of population to the cities and the corresponding decrease in numbers of the producing sections. They view with alarm the decrease in the number of milch cows, of meat-producing cattle, of sheep, and of swine, and the steady decline of export in our farm food products. They figure that if our population continues its normal increase, we must increase production, or prepare to go hungry in cities. Importation of food is not considered possible for the reason that there will be no place to get it. This phase of the situation has just begun to appeal to our city population, and distribution of food has become more of a serious problem to them than it is to the farmer. As a last resort the farmer could live on his own productions, but if he stored it for his own use the city could not escape starvation.

Fifteen years ago no city man listened when he was told that farmers received only 35 cents of the consumer's dollar. I was told by intelligent city-bred men that the 35-cent proportion seemed to them about right. Food was cheap in the city at that and no one cared. But the movement of population is always toward the best opportunity for making a living. The city bid against the country for youth and strength, and vigor and enterprise. It bid higher than the country and took the prize. There were more to feed in the city and less to produce in the country, and the "high cost of living" at last awakened the city population. Throughtful men have at last found the cause. They realize that the only way to reduce the cost of food is to reduce

: of distributing it. There is no hope in getting the to produce it for less than he now gets. He is giving up at present prices.

whole world has now recognized the danger of waste and gance in the distributing of food. In America we begin at we are the most wasteful in the world.

ı, through the initiative of this society, New York has way to reform in the creation of a Department of Foods rkets. No departure of recent years has been hailed with opeful enthusiasm from all classes of people. You are with the plans proposed to effect this reform. Briefly, assemble, grade and pack produce at local centers; to he local trade from these assembled products, and to ship plus to metropolitan markets. In New York the plans turing to establish a new wholesale market where could be assembled, and possibly numerous retail — all under the supervision of the state. It is proposed sales would be made under the regulations of the state, cial records made of the weight, grade, price and parties transaction, and prompt remittances returned to the Cold storage must be provided in the country, when l, to cool shipments, and when necessary to delay ship- Cold storage will also be provided in the city market to ent the country facilities, and to care for goods that can- promptly marketed. Manufacturing plants will also be l in the country and in the city terminal to can or dry at have become tender, or are not of the quality to ship

plan has received almost universal approval, and has been arly commended by men of large affairs and broad busi- perience. It is a big undertaking. It requires demonstra- rk in the country and patience and skill in meeting the es of the city. Incidentally it will require some money. ve everything else it will require your help and coopera- The city terminal market is offered to us completely l on rental by the New York Central railroad. It is a pportunity. While a cooperative operating company will ssary to insure proper distribution, I am convinced that the state should secure the lease on a long term, so as to control the output and regulate the business in the interest of both producer and consumer. Give us the means to establish this system and in five years we will reimburse the state for every dollar now required, and we will give New York the greatest and best produce market in the world. If the control of such a market were open to private capital to operate at a profit, it would be a tempting form of investment. The control of one such terminal would regulate the whole food distribution of New York City, and it would be a great misfortune to allow it to escape the control of the state. Within three hundred miles of New York City there are 20,000,000 people to be fed three times a day. It will take two billion dollars' worth of farm food products to feed them annually. If we were to save only one per cent. in distribution, we would have an annual saving of twenty million dollars; reduce it ten per cent. and you save two hundred million annually. Twenty per cent. I have always considered a conservative saving for an economic system of distribution, and this would give us close to half a billion dollars in savings.

We worry about the conservation of our mines and forests, of our rivers and our soils. We spend millions for schools and hospitals, asylums and reformatories, but we let food rot that would save them from starvation. We have societies for the prevention of cruelty to children, yet within five minutes' walk from homes where pet animals are nursed in the lap of luxury, I have found seven children in one dark basement room, clotheless, fireless and foodless. I have seen men weakened from hunger, and women dying a slow, miserable death from starvation. In these environments I have thought of the bountiful products of our fields, of their further great possibilities, of their present waste, and I have felt that in our present wasteful system of distribution we are abusing the generosity of God, and I cannot escape the conviction that unless we make better use of the bounties, we will yet be required to pay in full to the last farthing for our neglect and extravagance.

Our present civilization has developed a system that permits, if indeed it does not force, a control of the instruments of production and distribution into the hands of a few men. These e not necessarily the owners of capital, but they control it, ually use it with more reckless regard for all concerned he real owners would. No individual can compete with t organization. Since the early dawn of history we have seen lividual defeated by organization, or destroyed by it. Our t system of corporate organization puts the instruments of tion and distribution into a few hands, and enables the control of capital to limit the producers' reward to the of existence. The surplus of each man's production they riate to themselves, and thus accumulate colossal fortunes. nt bulletin of the Federal Department of Agriculture told the farmer is working for a living, but gave no explana- the system by which the wealth he creates in excess of the ties of existence is appropriated by those who control his , and the distribution of his product. The farm pro- studies this system with suppressed indignation, but the r finds his opportunity in hungry city stomachs, and the ist finds in the system an excuse for violence and reprisal. nfiscation of swollen fortunes is boldly advocated from the m and in the public press.

remedy this defect in our industrial system, the socialists put all the instruments of production in the hands of the These instruments would include land, buildings, ships, ds, machines, tools and materials. They would have these owned by the government instead of being owned, as they nainly are, by private citizens and private corporations. would have the individual subordinate his independence berties to the will of those clothed with authority to exer- e functions of the state. The individual would be continu- d hopelessly under the control and direction of the agencies state.

cooperative system is intended to avoid the dangers and ge of socialism on the one hand, and on the other hand to t the avarice of capital by limiting its profits to a fair re- or its use. The cooperative system puts its members in l of the instruments of production, pays capital a fair re- or its part in production, and distributes the surplus to — that is to say, to the members who contribute to the economic production and distribution of the created products. It is founded on ethics and justice, and it is the only apparent means to stem the rising tide of state socialism.

We confess our faults to correct them, and bring our dangers into view that we may avoid them; but we turn to the future with confidence and hope in the agricultural possibilities of the state of New York. In the past we bravely faced our trials, and averted impending disaster by stubborn perseverance and heroic sacrifice; but the tide of our fortune has turned and the future is full of promise. Our fields are productive; our orchards are productive; our herds are prolific. We produce more food to the acre than western lands that cost from four to six times the present estimated value of ours. Attracted by our advantages of cheap lands, productive soils, and the possibilities of our convenient markets, families seeking an environment of culture and refinement have already begun to turn to New York State. Our farm values are increasing, and hungry populations are stretching their ravenous hands to us to be fed. We will yet open a free channel for the flow of food to their doors and their sure rewards will bring us abundant prosperity and bless our farm homes with glad contentment.

THE PRESIDENT: The Chair has a few announcements to make. The Committee for the auditing of the treasurer's accounts will be Professor Stocking and Mr. Philip Munro. The treasurer will be very glad if you will renew annual memberships and take out new memberships at the door as you pass out. In reference to the program, if we were to pass over entirely the papers that we were to have tonight so that we would not have them at this convention at all, we would feel that we were losing something really substantial and important, but fortunately we are not going to lose them. We have two most excellent subjects that will be treated by experts in their lines. I need not plead with you about the qualifications of Dr. Pearson. He is known to the members of this association and presided over you two or three years. You all know what to expect from him. Many of you, especially the fruit growers, know something of J. H. Hale. I think it would be hard to conceive of a farmer who did not know

Hale, but I want to remind you that there is to be an opity to hear him. We have passed his address over until ow. We are sure to have it then and we hope to have a good attendance. Is there anything more for this after- If not, we stand adjourned until 9:30 to-morrow morn- Let me ask that we start promptly at that time.

THURSDAY, JANUARY 21

MORNING SESSION

Meeting called to order by the President, at 9:30 A. M., in the Assembly Parlor.

THE PRESIDENT: Gentlemen, we have quite a long program this morning. We will first hear a few reports of our committees, and a little later some excellent addresses, particularly one by Mr. Hale who will be with us before we adjourn this session. To open the session we will ask Mr. Fraser, Chairman of the Committee on Drainage, to make his report.

MR. FRASER: Mr. President, your Committee thought it wise to make this report in the form of some suggestions in regard to the benefits which might be derived from tile drainage in the state. Accordingly, the report was prepared in that way.

REPORT OF COMMITTEE ON DRAINAGE

SAMUEL FRASER

Some years ago, soon after returning from a ten-weeks' short course at an agricultural school, an elderly Scotch gardener, who had known me all my life, hailed me and said, "Well, laddie, what is the first grand improvement of land?" Wishing to answer the old man in the way he wished me to, I fenced by saying it would depend upon the land and what it needed. "No," he said, "the first thing for you to do whenever you take a piece of land is to drain it. That is the first grand improvement; then you can lime and manure and get the good of them, and can plow and till to advantage." I have never forgotten it and if I talk an hour I cannot say much more.

Among the benefits to be derived from drainage are:

1. A greater net return per acre due to a number of causes. The net profit received per acre is the measure of our success in playing the game. I am interested in farming; I have no other source of income — I know nothing else. It is a game. It is like every other game played for the enjoyment there is in it.

me itself is the running of the farm. There is no enjoy- n being run by a farm, nor in being turned like a water oy the water flowing over the farm. The ability to handle ituation as it comes furnishes zest; the difficulties sur- ed as they occur fan the enthusiasm, and the dollars in t the end of the year are the measure of success in playing ne.

rding to the evidence secured by our farm surveys, the on the average farm does about sixty days of actual work ar. Only a small portion of this work, of course, is devoted cultivation of farm crops. A certain amount of it is used hauling on roads and for such purposes. The days used ing land, then, are few, and yet how many of us have seen er waiting one or two weeks, or even longer, to plow his the spring for oats. Think of losing ten days out of a g season of one hundred or one hundred and ten — 10 nt. handicap! Yet it is so common we think little of it. own county (Livingston) it is estimated, and it is a con- ve estimate, that 80 per cent. of the land would be decidedly ed by drainage, and that probably 50 per cent. of it must erdrained in order to make it profitable from a commercial oint; and yet this is the situation in a county that is rated of the best in Western New York.

his condition prevails in such a county, what must be the on in other sections? We find farmers waiting in the perhaps for two weeks, when the season opens late in not being able to go on the land until the last of April v for oats. We see them deferring the plowing of their land until the first of June. The only possible crops that grown on land plowed as late as this are beans and buck- In our county we find many acres of land plowed the first in June or even later, the tenth of June, and sown the eth of June for the simple reason that the land could not be l properly before.

l in other sections we find men who could not get land ready ans. It has to be sown to buckwheat, because buckwheat sown after the Fourth of July. Such land needs drainage er that the farmer may farm it. Men have not been farming, they have been taking whatever they could get from the farm. Farming, as I understand it, means running a farm. In these cases, water and other conditions ran the farm and the farmer was a mere individual who derived something from it.

A striking illustration of the folly of trying to work some of these wet fields was forcibly impressed upon my mind by an occurrence some years ago. I was managing a farm which was sadly in need of drainage. Because of the lack of drainage the tenant had been unable to pay rent; he had not been successful. I believe it was entirely due to this fact. There was not sufficient land on the farm capable of being worked when it should have been worked, unless the entire land was left in grass and pastured, but pasture does not offer a very high revenue. The field I have in mind had been fall-plowed with the idea of putting it back to grass without any further expenditure, and to grow a crop of oats and reseed. Two fields along side of it had been underdrained at a cost of about $12.00 per acre; that is, the drains had been placed where they were absolutely necessary, no thorough drainage system having been attempted. But even this amount made a wonderful difference in the revenue secured during the six following years of which I have record. We were able in the spring to fit the land in good season and sowed the oats April 28. Another field was sown the same time and with the same lot of seed, but this particular field had been underdrained.

So far as the fitting of the land was concerned the two seemed to be about equal, both had been well fitted and the seed bed seemed to be about the same except in the wet places. Both fields were sown the same day and the seed was all treated alike. There was every indication, therefore, that we could get a good crop from both fields.

Part of the land on the field which was not underdrained was so wet at the time of sowing that the horses could not go through the swales or wet place which ran through the center of the field.

Rain followed soon after sowing and it continued wet about three weeks, which was later followed by a period of draught. During the wet season the oats were drowned out in many places and a poor stand resulted, although more seed was sown, three bushels per acre on the undrained field and but two bushels on the piece which was drained.

FIG. 487.— **SAMUEL FRASER**, CHAIRMAN OF COMMITTEE ON DRAINAGE

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he oats on the undrained field were so shallow-rooted that they ned earlier than those on the drained field. They were forced nature because their water supply was cut off.

Vhen we threshed the tally stood 23 bushels per acre for the rained field and an average of 60 bushels per acre for the ned field. The gain on the drained land was 37 bushels per , which at fifty cents per bushel would be an item of $18.50. s, however, is not all of the story. The cost of growing the was nearly the same on both fields, but the sixty-bushel crop of such good quality that part of it could be sold for seed. At t thirty bushels were sold at one dollar per bushel instead of cents so that the actual gain instead of being $18.50 was .50, less the item of extra threshing and cleaning.

'he total amount necessary to make one field as good as the er was $15.00 per acre. In other words, the one crop of oats ld have more than paid for the cost of underdrainage.

'his wet field has not yet (1914) been underdrained. It has allowed to go as pasture. It is an excellent piece of land; soil is rich, a good loam, not heavy, and if underdrained would one of the most profitable fields on the farm. As it is, for ten rs of my time and for sixty years previous, it has been nothing a drag on the farm. The twenty acres of land in this field ld be underdrained for about $300, and would more than pay this expenditure in production.

n some cases the underdrainage of a field would decidedly uce the number of hours of work to mature a crop as well as uring a crop. For instance, one may frequently see instances ere farmers who have taken considerable pains have gotten a of potatoes through the season, but a wet fall comes on and s impossible to dig them; or it takes four horses on the digger another four to haul a load off the field, and even then but f-loads are attainable. It is bad enough to have a crop drown , but it is worse to spend a whole year working it and have it dy to market and then find it impossible to harvest. One crop potatoes lost will frequently drain the fields two or three times.

\s already mentioned, the research in regard to the use of se labor in this state shows that in many counties the average ount of time which a horse is used during the year is sixty days. If land is underdrained one is frequently able to begin operations ten days earlier in the spring and work ten days later in the fall. In other words, the growing season of one hundred and forty days may be extended to one hundred and sixty days, or a growing season of one hundred days may be extended to one hundred and twenty. The farm is almost 20 per cent. more efficient in this one factor alone, but in addition the growing season of the crop itself is lengthened as well as the time during which the horses can be worked. There is also an increase in the yield of the crop because the roots are able to go down and utilize a great deal more of the soil than they could formerly. The water table is reduced by underdrainage and the air can enter the soil. I believe that this matter of utilizing the air to oxidize and cultivate our soils is one of the most important of the benefits which are derived from tile drainage. I do not wish to reduce the emphasis which is laid upon water removal but believe that the consequences of the water removal is of much more importance. The water is out to be sure, but the air is in and is at work oxidizing material, liberating the ingredients we need, enabling the organisms which we require to live and work for us, and they are willing to pay us to allow them to work and board themselves. I wonder if we have any other organisms that are willing to do so much for us provided we will use our intelligence and furnish them suitable homes. The soil is a home for both bacteria and other plant and animal life which are there to be utilized. It is also true that if our soil is not sufficiently aerated we may have it occupied by animal life which we do not desire.

You probably all are familiar with the interesting experiment at Rothamsted, England, where it was found that a particular piece of land was in a low state of cultivation, because of the large number of ameoba present in it, and these were feeding on the beneficial bacteria. Once this piece of land was thoroughly limed a marked reduction occurred in the number of amoeba. It was not nearly so good a home for them and they departed this life. The beneficial bacteria were able to thrive and increase in number, causing an increase in crop yield. In the same way, by the use of this drainage, we introduce better aeration; we use the air for tillage purposes; we fit the soil for the bacteria and other organ-

we need, and we enable the roots to descend to a greater
, and when they decay they have practically made channels
gh the soil through which the air can pass, and we save in
anical tillage. We all realize that tillage by mechanical
s is a very expensive operation. For example, if we under-
to plow twelve inches deep it is a very costly proposition, and
fit the land so that the roots of plants may penetrate to a
of two to three feet or more, as is the case with alfalfa and
r, we may till our land to this depth, for when we plow it,
ng the toes off the roots of the plants so that they decay, we
they have pulverized the subsoil, making it of value to other
s for succeeding years.

great deal is being said about the necessity of increasing our
yield, and we have been able to produce yields adequate
ractically feed the nation and leave some for export.
drainage, however, will tend to increase the yield per acre
out adding materially to the expense, for the interest on the
tment and the amount necessary to repay the capital will be
d by the crop grown. In other words, for the farmer with
of the nature outlined—land which cannot be tilled when it
d be (and this constitutes practically 80 per cent. of Western
York and perhaps the state) — there is a possibility of ac-
ng an increased yield without much additional expense, by
rainage. Or I might even say more — that the cost of pro-
on might be reduced. We had this very forcibly emphasized
e piece of land which we own. The part of it upon which we
ded the most money is underdrains, which was underdrained
feet apart in the first year, is the portion which has shown
reatest credit to date. The portion on which we have ex-
ed the most in drainage is the one which has repaid all ex-
itures on it first. We have, therefore, every reason to go
l as fast as we can get the capital and underdrain the whole
e farm, because it pays. Whether it pays or not is the most
usive demonstration we can get as to whether or not a certain
e is wise.

derdrainage makes it possible to more easily combat insects
iseases. It is always much easier to fight these troubles if we
go upon the land at any time. If the land is wet we must

stay off at some time when we should be spraying, and probably enough injury can be done on that one occasion to more than compensate for the total cost of underdrainage. Another way of stating what has already been said is that it increases the depth of our soil, making it available for plants, thus enabling us to double the size of our farms without increasing the superficial area. In other words, the farmer must realize that from the center of the earth up as high as he can go is his to be utilized. If he cannot utilize more than four or five inches he gets pay from this; if he utilizes twelve inches he generally secures more returns; if he utilizes two feet of surface he gets more returns than if he utilizes only five inches. The problem is to utilize everything — wind, water and soil. Wind is as big a factor in getting cash returns from the soil as the water, provided we use it rightly.

Drainage makes the use of lime, manure and fertilizers more profitable. It is folly to continue to haul manure on land which is water-logged, and it is a waste of time to sow fertilizers and lime on land which cannot utilize it properly because the bacteria are not present and cannot live. In other words, the factor of stimulating the activities of the various beneficial soil bacteria, plants and animals, is closely related to the returns secured from the application of manure, lime and fertilizers. One might almost say that the two go hand in hand, and the proper utilization of these things can only occur when the soil is in fit condition for the beneficial soil bacteria to live. If we take one factor in farm management which is to be elevated above another, then underdrainage is the most important, provided the soil needs underdrainage. These agencies tend to unlock vast stores of practically unavailable food in the soil and subsoil, making our crops of more value in themselves and of more benefit to live stock to which they are fed.

When land is underdrained the character of the herbage is completely changed. Even if such land is allowed to go into grass we find marked improvement in the health of the live stock, for the domestic animals grazing upon poorly-drained land are much more subject to certain diseases than they are when grazing on well-drained land. On sheep farms the value of having land well-drained is well understood. Probably those of you who are liar with English history and agriculture know of cases e the underdrainage of pasture lands has practically re- d the difficulties which were formerly common, for instance iver fluke. This small parasitic animal passes part of its ence on some damp grass, and the more damp and marshy the re the better the home for the liver fluke.

our agriculture we have not found it expedient or profitable derdrain pasture, but the time may come when it will be mical to do so. At present the time is ripe for the drainage nd for tillage crops. Of this there is practically no question. regard to results on specific soils — let us consider the irk series which constitutes such a large portion of Western York, along with the Ontario series. We might say that ything except the Dunkirk gravelly loam or Ontario loam — is, on the loam, the clay loam and the clay, silt loam — we drainage practically a necessity for successful farming. The is true of the Clyde and most of the Volusia series. One esting factor which has come to my notice on the Dunkirk loam and clay is the presence of a large amount of Epsom . If, during the month of May, we go through the pastures e this soil occurs, or anywhere that the land is left undis- d and is not underdrained, one can frequently, in a dry time, spots of land with a salty deposit on the surface of the soil. examination it will be found that this consists largely of esium sulphate or Epsom Salts. The remedy for this is derdrain and apply lime.

Ontario, Canada, where Professor Shutt has worked on problem, it was found that in this one instance the applica- of quicklime was much more beneficial than that of ground tone, because it was more quickly acting. However, drain- is the primary factor in the removal of this salt, because it les the soil water to carry off the magnesium sulphate so that oil moisture does not have to be brought to the surface and n rid of by evaporation, and the salt deposited as an incrus- n. In many places this tends to destroy herbage, so that of the important grasses can survive. Such plants as ox-eye seem to have a greater resistance and they live.

one will pick up an agricultural book of fifty or one hundred years ago, especially one written in Europe, he will find a chapter devoted to the utilization of burnt clay, with a description of how to make the clay pit. The latter was made in about the same manner as lime is burnt today, only the burn was of wood and clay, the whole thing being fired in time and the burnt clay spread upon the land. I am an advocate of burnt clay, or rather, I should today use burnt shale. I should, however, prefer that it be burnt in a particular shape, made up into pipes, twelve inches long and three or four inches in diameter, cut off square on the ends so that they may be placed together, and the whole deposited at least thirty inches below the surface of the ground, at the rate of about two tons per acre. If properly applied, this application will not need repetition inside of seventy, eighty or perhaps one hundred years. It will do more for the land than two tons of nitrate of soda, which would cost more. At the present time the two tons of clay may cost about $17.50, whereas two tons of nitrate of soda would cost $100 or thereabouts. The nitrate of soda would not all be applied in one year like the clay, but would be applied at the rate of one hundred pounds per acre per year. This would last forty years, but the clay will last twice as long, be much more efficient and cost but one-fifth as much.

When the city man takes possession of a farm he usually wants to build a barn. He wants something he can see, a place also which the assessor can readily value. Personally, I should much prefer to spend the money in tile, underdrain the farm, and then build the barn to hold the crops of the farm. Our idea of the barn will be vastly different. It will probably need to be much larger than required in the first instance, and the assessor will never see the tile; they will not show themselves. And he will never put any increase in value on the land unless they are there.

The unfortunate thing is that if you wish to sell the farm little value will be placed upon the tile. Purchasers do not yet consider this to any great extent. If one is buying land to sell it would be much better to take the other view and spend the money in paint for the buildings rather than in tile, and then look for some individual who wanted a bargain; but for the farmer the other course is preferable.

Wherever one has hardpan the trouble may be removed by ough underdrainage at frequent intervals; that is, probably y forty feet. In some cases fifty or sixty feet are adequate tile drains. I am thoroughly in sympathy with the thorough erdrainage of land; I have no use whatever for a hit and system. I believe that the plans in the first place should be e so that the whole system is complete. Whenever we start farm we make a plan showing where the drains will go — y, fifty or sixty feet apart, according to the soil and condition. is impossible to put in all of the drains at one time, we put in at eighty or one hundred feet, or, if they are to be sixty apart, we put them in at one hundred and twenty feet, locatthem where they will do the most good. In this way the land be made remunerative as we go along, and pay expenses. , by attempting to underdrain at seasons of the year when ill not conflict with other work, and having a regular pro- n, it is possible to do two or three miles of tile a year on a of two or three hundred acres, and it takes but a short time nderdrain the entire farm. If one undertakes to do all of underdrainage at one time — and this is possible where one adequate capital — it becomes a very important financial ation. If one undertakes to spend $40 per acre on a two- dred-acre farm, it is a matter of $8,000, which frequently gers the man who considered that when he made the pur- e of the land he had made his largest investment. I believe is one of the things we have to learn in this country — that man who has purchased a farm has not necessarily made his e investment. We have to realize that it is folly in many where we are looking to the farm as a business proposition ssume that 20 per cent. of the price of the land is adequate stocking and operating it. Yet this is a common figure.

the Genesee valley, which is regarded as one of the best ning sections in the state of New York, if the farm is worth per acre, then the land is worth but $25, for $25 are in the es and $25 per acre are in the buildings, leaving but $25 the land itself. In some instances the barns are practically value to the owner, or are of such value that they are merely as makeshifts pending another change, and the value then is e land itself. On this basis the land is worth $25, and will need the expenditure of $35 or $40 per acre in underdrainage alone in order that it may be handled profitably. This in itself would bring the total value per acre for the farm to $115 per acre and it will be in much better condition to pay 6 per cent. on $115 than 6 per cent. on the $75 after drainage has been completed.

Unless one goes into a special type of farming such as fruit-growing, where thorough underdrainage is necessary to begin, I should much rather advise the expenditure of $15 per acre, but should insist on a complete plan being made before the $15 is expended. I think that much of our money goes to waste because the individual has not a clear conception of where he is going to finish. I believe this is a prime trouble in our agriculture as well as in some other lines of endeavor. If we, in our lives, have a definite plan in mind, we shall be much more efficient than if we drift, and the same is true on the farm. The man should have a plan mapped for the next thirty or fifty years, or, if he has children to follow him, he should plan as do the Europeans, for a century at least.

If I may digress: I think there is one thing we can admire about the German system and government and that is the forethought that has been displayed in organizing the nation for a particular line of work. The organization and the course which it was to follow was mapped out in advance of the showing of the land, and the same policy in agriculture or in drainage — in fact in any operation in agriculture — is the policy to pursue for business results.

On all of our land we have taken forty or forty-four feet apart as our unit for drainage; that means that drains are in today at eighty or eighty-eight or perhaps forty or forty-four feet. They are placed at some of these distances because they fit in then with a system. The forty-four feet is brought about by the fact that in all our orchards the trees are in at forty-four feet or twenty-two feet or eleven feet apart in one direction and that is the direction in which the drains go. On a piece of land which it was recognized as good farm land sixty feet was fixed as the distance to aim at. On another which was used as a nursery entirely, and will then go into farming, forty feet was preferred, at forty feet and at least thirty inches deep, preferably -three inches, for the excavation was the desired depth.

ither by legislation or custom have we recognized or ac- l as a policy that land is a good investment. We find it nized that land has a certain value. That value is made by tions other than the amount invested in the land. It is by a number of outside influences, and, in this country, one serious factors influencing the price of land in the East en its availability in the West. You all recognize that land East has not been a safe investment in which to sink . The farmer has to be convinced that the contrary is true. ave so long accepted the statement that one should buy nd let it lie rather than try to improve it, that our farmers oroughly convinced that this is the best policy. Our con- s differ from those in Europe and probably it is good that o. However, the time is ripe, perhaps, for instructing the rs of the state that it is a safe proposition to invest money m improvement, and that drainage is one of these. How money can safely be invested in land will have to be worked I think perhaps one of the important illustrations of this nay be derived from the study of the conditions in the north land. In the Province of Ulster the tenant has had, for a many years, what is known as "tenant rights." The tenant nted the land with such buildings as were on it, and, if any vements were made, such were done by the tenant and they e his property for him to sell to the incoming tenant. You e interested to know that land valued at $200 per acre by lists — that is, land which is turning in a rental of $6 and sume that it was 3 per cent. on the capital — has sold at per acre by tenant right. In other words, the tenant had ed as much or more than the landlord previously had. In ion, such a tenant might have $100 or more per acre in- l in live stock, and then some in tools and equipment, so he value of the capital used to run an acre of land might o or three times its value, instead of 20 per cent. of it.

m speaking now of good general farming — not specialties, of course would demand much more capital. In many in Ireland as well as in England, during the last sixty years the landlord has invested more than the present value of the land. The same thing is true in the state of New York. Land prices do not return sufficient for the investment made. The purchaser does not pay any more for land that is underdrained than for land which is not drained. We do not recognize the increase in value. Farm prices have increased to some extent in recent years, but this is not due to recognition of the improvements made, but rather to a general uplift in prices of land and real estate. Such advances are not made on a farm basis; they are speculative real estate advances.

To return to the figures I have given you in regard to the Province of Ulster, these "tenant right" values are the sums which incoming tenants pay to outgoing tenants for their rights, and in cases they run from $150 to $250 per acre. The point I want to bring out is that in many cases a large proportion of this tenant right is due to the cost of tile drainage — tile drainage, making water courses, straightening of ditches, improvement of the fences, tearing out the old fences and throwing the pieces into larger fields, and in some cases erection of buildings. Also, a certain amount of value is allowed for the soil improvements and unused residual value of lime and manures. Probably all are aware of the remarkable change which has come over the Irish situation in the last ten years — how the British government instituted a Land Court and the land was bought from the previous owners. In fact they were compelled to part with it at values fixed by the land courts. This, in many cases, led to the temporary neglect of land when it was to go before the land courts for valuation. In other words, the farmer who was desirous of securing his land would give it a "preparation." He would block up the ditches, neglect the fence rows, let the doors of the barn fall down. He was fitting it for a fall in value, and these methods often worked.

It would seem in many cases that our farmers were thoroughly impressed with this fact, and have made preparation so that we have values that are commensurate with the appearance of the farm and its surroundings. Only in our case we got the fall in value years ago and everything fell to the value given. Today there is a tendency to put more capital into the farms of this state, but we are not nearly up to the level which European agriculture demands in order to make a profit. How far we can go will be a problem for the farmer to solve, but I believe we are safe in advising our New York farmers to invest up to $30 per acre in underdrainage of farm lands which need it, and are located so that they can be farmed. The fact remains, however, that unless they get the $30 back in increased crops, which is possible, they cannot expect to get it back in the increased price of the farm. To be safe, drainage must be charged as an operating expense and not to capital, and I should rather have the field and crop grown show a loss, than pad the inventory with a sum which might never be realized, if I had to sell out at once. You may not agree with this and you may be right, but I hate to tell a man he has a dollar when I know he has spent it, and I think there is no fool as great as he who tries to fool himself.

THE PRESIDENT: We will now have the report of the Committee on Cooperation.

REPORT OF COMMITTEE ON COOPERATION

CHARLES R. WHITE

Your committee feels that while the development of cooperation in this state is not all that might be desired, yet advances have been made of sufficient importance to allow ground for congratulation. Since the society adopted the policy in 1911 of working to inaugurate practical cooperative organizations rather than placing importance upon general discussion and resolutions, steady advance has been made, and by legislative enactment machinery has been put into operation which, if afforded financial support and wise administration, will lend impetus and solidity which will lead to ultimate success. In the general consideration of the question of cooperation, there is a tendency on the part of cooperators to lay great stress upon some particular phase, and make that one particular line a hobby to the exclusion of others. But those who have had opportunity to come into close touch with the agricultural interests of the state are in accord, that no single phase of cooperative effort is suited to all sections of the state; some sections will be served best by cooperative effort, while in other sections it would not be at all applicable to their conditions and problems. Therefore, a most careful study of each locality is essential before any wise constructive effort can be inaugurated.

Generally speaking, cooperative undertakings may be classified into three general groups — social, education and commercial — and in many instances each dovetails into the other to such an extent that their benefits partake strongly of the whole. It must be recognized that with individuals as well as communities, their success, regardless of other influences, must first rest upon maximum production produced at minimum cost. In many communities this is not possible under existing conditions, because their plants with which they are undertaking to create this production are in such a crude state that it would be impossible, even at the highest possible market price, to realize an income which would allow a reasonable living wage for the farmer. In many of these sections, even though the citizens are aware of their condition, individual effort will not bring about improvement to any marked degree, but cooperative effort would work to great advantage. This is particularly true in our dairy and livestock sections where, in a great many instances, the production is made at a cost far in excess of the value of the product, if sold under the most favorable conditions. This would render cooperative selling of little effect until the cost of production is reduced.

In the opinion of your committee, there are two lines of cooperative effort which will serve the above-named conditions, and should be fostered by the provision of ample funds and wise constructive organization through the Department of Agriculture — namely, the cow testing and breeders' associations. There are innumerable dairy and live-stock sections where the revelations brought about through the cow testing associations would lead to the elimination from the herds of inferior animals, and by the organization of breeders' associations, pure-bred sires could be placed at the head of those herds, with the result that a greatly improved condition would prevail.

In several instances where cooperative creameries have been properly organized and managed, they have made wonderful

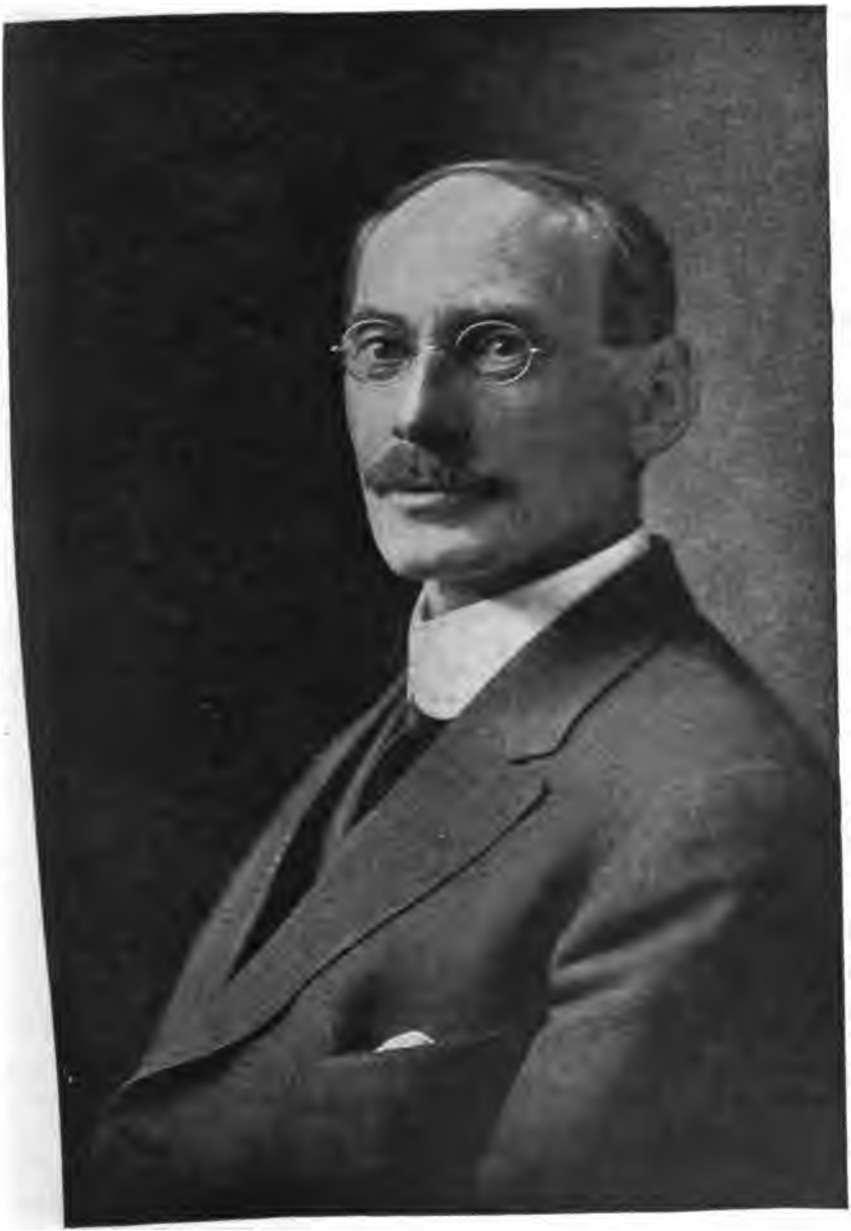

FIG. 488.— C R. WHITE, CHAIRMAN OF COMMITTEE ON COÖPERATION

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. One instance which has come to the attention of your
i is worth considering. The butter fat sold in the form
during the year 1913 was as follows:

	47c	July	38c
y	45c	August	42c
	43c	September	43c
	40c	October	47c
	35c	November	50c
	32c	December	50c

needless to say that this creamery is producing a very
s product, and is catering to a trade that will pay for
ducts. In another instance, the creamery has become so
us that at the present time it has a surplus of over $10,000
easury. Several other such cases might be cited.

are many associations in the state, engaged principally
asing supplies, which are meeting with a very large de-
uccess. Marketing associations are operating with equal
With the latter associations, the adoption of the packing
is been greatly stimulated because of the apple-packing
general principle of which your committee cannot too
endorse.

narketing of the products of the farm offers greater oppor-
than that of any other wherever conditions are ripe for
duction, and no one need wait for the development to
further to open the way. There are hundreds of sections
ate where the conditions are ripe and ready, but the suc-
ich undertakings will depend, to a very large extent, upon
rstanding of the cooperators of the exact workings of the
corporation. It is not enough that they be made ac-
with the benefits and general methods of operation, but
the utmost importance that they should be made aware
ifficulties which surely will be experienced. They should
nd the relation in which the members stand to each
d to the organization, and should realize that only through
on the part of each and every member can the greatest
of success be attained. It should be impressed upon

every member that the success of any undertaking cannot b measured by individual transactions, but must be measured b the average success of a number of transactions extending over considerable period of time. It is unwise, dangerous and dishonest to urge membership upon would-be cooperators withou fully appraising them in every particular with the facts and conditions relating to the undertaking; and, while it may make organization more difficult, it will render results more enduring, an the final success will be more quickly attained. Failure and success will each influence in their respective directions, and failur will just as surely block the way to development as success wi open wide the gates. In view of the foregoing, we strongly advis that no one should enter into the work as an employee of the stat for the purpose of advancing cooperative work who is no thoroughly acquainted with the details.

Another requisite to successful marketing is the standardizing of the products. Until the purchaser can know by certain standards and brands what dependence to place upon the article of th seller, he has no basis upon which to place a value. If brands ar to be of value, they must always convey the same understandin of the kind and quality of the article of which they are descriptive. Every brand bears a true relation to the reputation of it owner, and is worth no more or no less than his reputation whether it be an individual or a corporation. The success of th proposed city markets will, in a very large degree, depend upo the organization of cooperative selling and packing association which can furnish the products properly and standardized. Likewise, the benefit which the farmer will receive through city markets will depend entirely upon the extent to which he take advantage of such local cooperative associations.

The success of the large manufacturing institutions of th country is largely due to the fact that they have discontinued th employment of dual-purpose men. The producing end of th business concerns itself entirely with the work of production while the disposal of the finished product is left entirely to me who are equally expert as salesmen. Most manfacturing establishments are corporate institutions and take advantage of opportunities afforded them to merge the interest of many in a singl taking. Farmers should take advantage of the same oppor- y, at least by merging their interests to the extent of market- nd the employment of men especially qualified. A single ice will illustrate this point: the most successful of the sub- y associations of the Eastern Fruit & Produce Exchange d and graded, through their packing houses where up-to-date niences are established, 145 carloads of standard packed s. These apples were sold through the Fruit & Produce ange at the highest market price, and not in one single in- was there a rejection or a complaint. The barrels were shed and the packing accomplished at an expense of a trifle an fifty cents per barrel. The barrels cost thirty-eight cents, ıg the expense of packing the fruit a trifle under twelve per barrel, which is less than half the expense of packing ruit without the conveniences and organization which sup- d it. This success was doubtless due to the fact, to a large t, that the man in charge of the packing house had had seven ' experience in apple packing in the Northwest.

ur committee believes that a bill of essentials, which should ibe in detail the objects, the difficulties, the demands and e full particulars in relation to the association as have been rth, should be attached to each subscription for stock in the ization, and that each applicant for stock should be required n this, together with a declaration agreeing to support the ution under all of these conditions. While this may delay what the final organization, when it is once established it e of greater value and of permanency.

E PRESIDENT: We have a paper this morning considering ame situation as it affects the farmer, by Alfred C. Weed of Rose, N. Y.

GAME LAWS AND THE FARMER

ALFRED C. WEED

hall start this talk by making some mention of a newspaper nt of a speech by Mr. Hornaday, Director of the Bronx Zoological Gardens of New York City. A week or so ago ade a speech at Rochester, N. Y., in which he praised the gentleman hunter. Personally, I believe the gentleman hunter is a more or less mythical creature. Mr. Hornaday predicted that the wild game in this country would be exhausted in twenty years, and advocated very much more stringent game laws. It seems to me that most of our game laws are at present too stringent in many ways and not stringent enough in a few cases. The attitude of the New York farmer towards the game laws seems to be that, without any regard to the value of any returns he can get, simply from a sentimental point of view, he wants the game protected on his land. The farmers like to see the game birds around, but they also want to have protection from trespass. The present laws do not give good protection. The changes made last winter were a slight improvement.

At present if a man wants to punish any trespasser on his land he has a hard fight on his hands. The prevention of trespass on posted land ought to be in charge of the peace officers of the town. It ought to be the province of the game protector to arrest any man found on posted land without a permit in his pocket, showing that the owner gave him permission to hunt there. We could almost suppress trespass if we did that.

The gentleman hunter in our section comes out from Rochester in his high-powered automobile. If he sees a pheasant in a field, and the fence is hard to get over, he gets out his pliers, cuts the wires and runs the automobile into the field. After he has shot all the birds he runs back into the road and goes on. That is the gentleman hunter as we know him. I do not know what kind of a gentleman hunter Mr. Hornaday knows. He is a very able zoologist and was at one time employed by Ward's Museum at Rochester to collect all through the East Indies, but some of his utterances lately read as though he had done most of his recent field work within the limits of Greater New York.

But the game law as at present written in the books would be much more favorable to the farmer and could be enforced better if the attitude of the Conservation Commission were more favorable. This attitude seems to be: "The state owns all the game and will pasture it on the farmer's land without compensation to the owner of the land, and will take every precaution to prevent the owner of the land from getting any benefit from it." That, it s to me, is the attitude of the Conservation Commission up nuary first.

want to say something of the various classes of game that we on our land; first, the game birds. Ducks and geese are that you may be interested in. Their value to the farmer e present time is very slight. They do not eat very many that interfere with the crops, and their injuries to the farm lso very slight. Geese will occasionally pasture on a piece heat and do some damage. There has been a great deal of tion lately that certain of the ducks of the country are likely exterminated — the wood ducks for instance — but I believe long the South Shore of Lake Ontario many more are breed- than are thought to be. I know in Sodus Bay there were ably fifteen or twenty broods raised last year, but in spite of act that the shooting is prohibited by state and federal law, y of the young birds were killed and eaten. The game pro- r cannot stop this. It is a physical impossibility. The best n do is to catch a few violators of the law and fine them. He territory ten miles wide and thirty long to cover. There are big bays there and men can shoot a lot of ducks without his ving it. The blue-winged teal is more in danger. They breed ly in the Middle West, in a country that is being settled and ned so that their breeding grounds are being destroyed.

he pheasant is another bird about which there is a great deal iscussion. Pheasants are certainly a benefit to the farmer. y eat a great many grasshoppers and bugs, but of course some n. I have heard reports that they pull corn but can get no ite data; I know they pull some corn and pick some apples. ear ago in our orchard perhaps a bushel out of four thousand els were injured by pheasants. The danger of extermina- of these birds is not great. They are marsh birds and so long marshy and swampy land is left the pheasants are not in ger of being exterminated. The game laws are very strict, ough not enforced very strictly. The pheasants could be ected a great deal more than they are if the farmer was n more leeway. At the present time, if a farmer wants to ect the pheasants on his land he must first make a private park for them, seeing that the whole boundary is well marked in some way, then he must take out a breeder's license from the Conservation Commission, after which he may be able to breed a few pheasants and keep them.

When a farmer finds a nest of pheasants' eggs where the old bird has been killed, the only thing he can do now is to leave them to rot. If he picks them up and carries them to his house, he is liable to arrest. If he waits to hear from the Conservation Commission, the eggs are rotten before anything can be done.

The ruffed grouse or partridge is a bird that is becoming quite scarce. These are valuable to the farmer, since they eat a great many injurious insects. They do a little damage to budding apple trees in a very severe winter, but I think in most cases they prefer the red birch or the yellow birch. I find they do feed on these trees when nearby. They are in need of more protection and in need of feeding during the winter, but we farmers do not feel we want to feed them if they are simply going to be a bait to get someone to come through and trampel our crops, and perhaps shoot our cattle. If we could be protected, we would protect the birds much more.

The situation as to quails is the same as that of the partridge, only I do not think quails are in any way injurious. Quails are not known to do any damage in the grain fields; in fact when the wheat is ripening they are feeding almost exclusively on insects. About all the grain the ruffed grouse or the pheasant eats is the waste grain on the ground after harvest. But we can not protect these birds. We can not, for instance, take a setting of eggs and put them under a hen and keep the chicks in a pen for a few weeks until they know their home, and protect them in our barnyard. Many men would like to do that, but if they attempt it the game protector would have them arrested and fined. Then, if the birds are not driven away and kept driven away, and the warden finds them again, that is another offense and another fine must be paid. He can keep this up every two or three weeks as long as the birds live, and the Conservation Commission will uphold him. However, I know of one case where they did stop a prosecution. A man found three pheasants in his orchard nearly frozen. He l them up and carried them into his chicken house and fed Then they got the habit of coming in to be fed. The game tor came along and the man was arrested and fined. He led, and while the appeal was pending the Conservation nission advised that the matter be dropped.

the game mammals, deer are the most destructive. They very little value to the farmer except that sometimes the r can board a deer hunter a few days in the fall. In some ns the injury they do is very great. I have a letter which f deer taking all the heads on five acres of buckwheat; the vill make affidavits. I know of a garden in Maine where they ence palings seven or eight feet high, and the deer jumped over the fence into the garden. When anyone approached vould jump out and get away and be back in a short time.

rabbit is of value to the farmer mainly as sport. It is fun out and shoot a few rabbits, but at times they do serious ge. I know of one case where rabbits and mice cleaned up r orchard. The rabbits ate the trees down level with the and the mice girdled the trunks below the snow. There is nger of exterminating the rabbits, provided the sale is prod. For many years the use of ferrets in this state has been cally prohibited; I do not believe this necessary. Rabbits t be exterminated unless they are sold for food. By the use rets they can be reduced quite seriously, but if the sale for is prohibited, all who wish can be allowed to use ferrets. is no danger of the rabbits being exterminated, because no will kill for sport very many more than he can eat or give

squirrel's value is sentimental. I like to see them. I kill one. I do not feel that I want to, and the injuries from are very slight. Occasionally a red squirrel will eat pears. that one. The danger of exterminating squirrels is not great. They are so difficult to find that most people will say are gone when they are really quite numerous. In one case Utica, I was told there were no gray squirrels anywhere d. I went out one morning at daylight and stood quietly big tree. When I stepped on a little twig beside me, I saw uirrels in the woods where nobody had seen any for perhaps ten years, according to all accounts. The only protection they need is to have the present laws enforced.

The porcupine and woodchuck are not usually classed as game animals, although they are about as valuable for sport as are rabbits. Woodchucks give a great deal of trouble at times. In a bean field a woodchuck will nip the tops off one row after another right straight down, maybe cleaning up two or three acres — one or two woodchucks — in a few days. The porcupine works on trees usually, but sometimes in gardens. I read recently that the supervisors of Greene county had offered a bounty on the porcupines because they were destroying gardens in the early summer.

Among the fur-bearing animals that the farmer is most interested in are the weasel family — the weasel, skunk, mink, sable, marten, etc. The skunk is the only one of much value. Their food is almost exclusively injurious insects. Occasionally one will get the habit of killing chickens. Set a trap near your chicken house and you can get him the first night. Most of them should be protected, and they are at the present time. The law is so framed now that in most sections one can not take them for fur until they are prime, and the season closes in the spring before many of them are out of their winter dens. So if the present law is enforced there is not much danger. The mink sometimes does some damage.

Although most people think the otter is exterminated, I saw one last summer within two miles of a summer resort. He was swimming away out in the bay, and I got within one hundred yards of him in a motor boat. I saw one a little later at the head of the bay.

The weasel is a fur-bearing animal, but beyond that one can not say much good about him. He does not eat many injurious insects nor kill a great many mice, and he does destroy a great many birds and sometimes does damage in the chicken house. Perhaps he ought to be exterminated.

The sable and marten live mostly in the woods. The skunk, the mink and the otter offer considerable possibility of propagation for fur, and when we get the laws changed around so that it is feasible I think there will be quite an opportunity for that to be as a side line. At the present time the "red tape" in the r is quite burdensome.

e raccoon is rather valuable to the farmer — that is, he eats injurious insects. He does quite a bit of damage in the ields. The raccoon eats practically everything — fish, grain, t all kinds of garden truck, and almost all kinds of insects. like to dig out a bumblebee's nest the same as a skunk, but, e whole, I think they are more valuable than injurious. It be possible to propagate them successfully for fur.

e fox — that is, the red fox — has some value and does some ge; probably the damage rather exceeds the value.

e muskrat does not often do much damage, although I under- that a man on Long Island had some corn destroyed last ıer. The muskrats came up and ate the corn because there no water plants for them to get. They seem in some ways er possibilities for propagation for fur. I understand that aryland they sell trapping rights on swampy land. I believe ents run as high as $40 to $50 an acre for the privilege of ing muskrats on a piece of swampy land.

seems to me there are certain changes in the game law that ecessary. First, the people ought to be enabled to take advan- of section 159. I shall read part of it:

> Commission may issue a license revocable at its pleasure to any person, ting the holder to collect or possess fish, aquatic animals, quadrupeds, birds' nests, or eggs for propagation, scientific or exhibition purposes.

st spring I wrote to the Conservation Commission, asking uch a license, and I received a letter from the chief game ctor, saying that they could give me no such license, that it nly issued to officers of duly chartered museums or societies porated for scientific or public exhibition purposes. In other , they simply choose to ignore the first part — their ability ue a license for propagation purposes. They say in effect have the power but we will not use it." It seems to me that w should be changed so that when evidence of good faith is n they should be required to issue such a license. This is ded for in certain cases under section 372.

> Commission, when it shall appear that such application is made in aith, shall, upon the payment of a fee of $5, issue to such applicant ders' license.

This applies to elk, deer, pheasants, black ducks and mallard ducks. No other kind of ducks can be bred in captivity, unless under section 159. For instance, I should like to have a flock of green-winged teal around the barn-yard. I should like to keep them as any other flock of ducks. If a few want to fly down to the bay I can let them go. A few will stay year after year. I know of a flock of black ducks that was kept around a barnyard for a number of years. The first years the man had them he considers one hundred young birds went down to a nearby bay and bred there. A few stayed and he has them. I should like to keep a flock of ducks and some ruffed grouse under those conditions, but cannot do it under the present law. They simply refuse to issue such a license.

In the matter of raising fur-bearing animals, the law simply says that you must pay a license fee of $5 for the privilege of breeding fur-bearing animals, but under its rules and regulations the Commission says that in addition to the license fee a bond of $500 must be given. There is one clause in one section of the first part of the Conservation Law that may give them that power. I do not know.

I mentioned the necessity of permitting rabbit hunting with ferrets. We ought to give the game wardens power to arrest for trespass, and breeders' licenses should be issuable by town clerks the same as hunting licenses.

There is one other point I want to mention, and that is the ownership of game. Section 175 of Part 3 of the Conservation Law reads in part:

> The ownership of and title to all fish, birds and quadrupeds in the state of New York, not held by private ownership, legally acquired, is hereby declared to be in the state.

They make the declaration that the ownership is in the state and thereby indicate there is a chance for doubt. They go on to say:

> No fish, birds or quadrupeds shall be caught, taken or killed in any manner or at any time or had in possession, except the person so catching, taking or killing or having the same in possession, shall consent that the title to such fish, birds and quadrupeds shall be and remain in the state of New York for the purpose of regulating and controlling the use and disposition of the same after such catching, taking or killing, except that the title to such fish, birds or quadrupeds, legally taken, shall vest in the person so taking or possessing the same, subject to the provisions and restrictions of law.

We are required where we take out a hunting license to subscribe to that, whatever it may mean. In signing our name on the back of the hunting license, we subscribe to everything in the game law, and this is one of the clauses.

THE PRESIDENT: There is probably no class of producers in the state who are more in need of organization and help than the dairymen, and Mr. Albert Manning has been giving considerable attention to their organization in this state for a number of years, and he will tell us something about the Dairymen's League.

POSSIBILITIES OF THE DAIRYMEN'S LEAGUE

ALBERT E. MANNING

There was a time when the farmer went to the city at regular intervals and arranged the terms of sale for his milk with the dealer who distributed a few cans of milk. Later these dealers organized and had a price-making board. In other cases stock companies were formed with large capital, and as these organizations became larger and stronger the individual milk producer realized that his part in arranging the terms of sale for his goods was vanishing, and the only alternative for the producer was to meet organization with organization.

Therefore, the Pomona Grange of Orange County appointed a committee to interview the organized New York dealers for the purpose of securing representation in their councils, which at that time practically established the basis upon which all milk for the Metropolitan district was bought.

We were met with the argument and objection that the grange represented many branches of agriculture, the milk industry being but one of them, and that as an organization we had no power to sell even the milk produced by our members.

To meet these conditions a separate organization of milk producers was formed and called the Dairymen's League. The milk of its stockholders was consigned to the league and its board of directors was empowered to act as agents to negotiate terms and conditions for the sale of the dairy products of the stockholders, and also to promote or discourage legislation affecting the interests of its members.

In a quiet, conservative way the organization has continued to grow until it now has 340 local branches, the purpose being to have a local branch at each shipping station. It now has 13,000 dairymen as stockholders, representing 190,000 cows located in the following forty-three counties: Orange, Ulster, Sullivan, Putnam, Dutchess, Columbia, Saratoga, Washington, Fulton, Herkimer, Lewis, Oswego, St. Lawrence, Franklin, Jefferson, Schoharie, Greene, Delaware, Otsego, Oneida, Madison, Chenango, Broome, Cortland, Onondaga, Tompkins, Cayuga, Tioga, Chemung, Steuben and Allegany in New York State; Sussex and Warren counties, New Jersey, Wayne, Wyoming, Bradford and Susquehanna counties, Pennsylvania; Litchfield and Fairfield counties, Connecticut, and Berkshire county, Massachusetts. It represents nearly two-thirds of the supply to the Metropolitan district.

Next the league was met with the argument that the anti-trust laws would not permit conferring with the league. If that fear is well-grounded the situation resolves itself into one or the other alternative. Either the distributor should fix a schedule, and the producer accept it; or that the producer state the price and the distributor pay it. For it would be criminal to get in sight of each other and talk it over. The anti-trust legislation has placed cooperative organizations and corporations where they know not what they can or cannot do legally, and tends to enforce producers to follow labor union principles to secure recognition.

Naturally the organized dealers and corporations having so long assumed the right to establish the schedule of prices to be paid, that the producers were reluctant to give up that advantage.

The league recommends that each local branch own or control the receiving station. In many instances the producer hesitates to assume this financial obligation and the business responsibility of operating the plant, but those that have been established have demonstrated in most instances that they can increase the receipts from 6 to 15 per cent. Upon this basis a well-managed plant will soon pay for itself.

In the evolution of the marketing problem through the Commissioner of Markets, the farmer-owned cooperative plants may prove an important and necessary cog for bringing the producer and consumer closer together. The farmer is placed in a position to control the form in which the product may be placed upon the

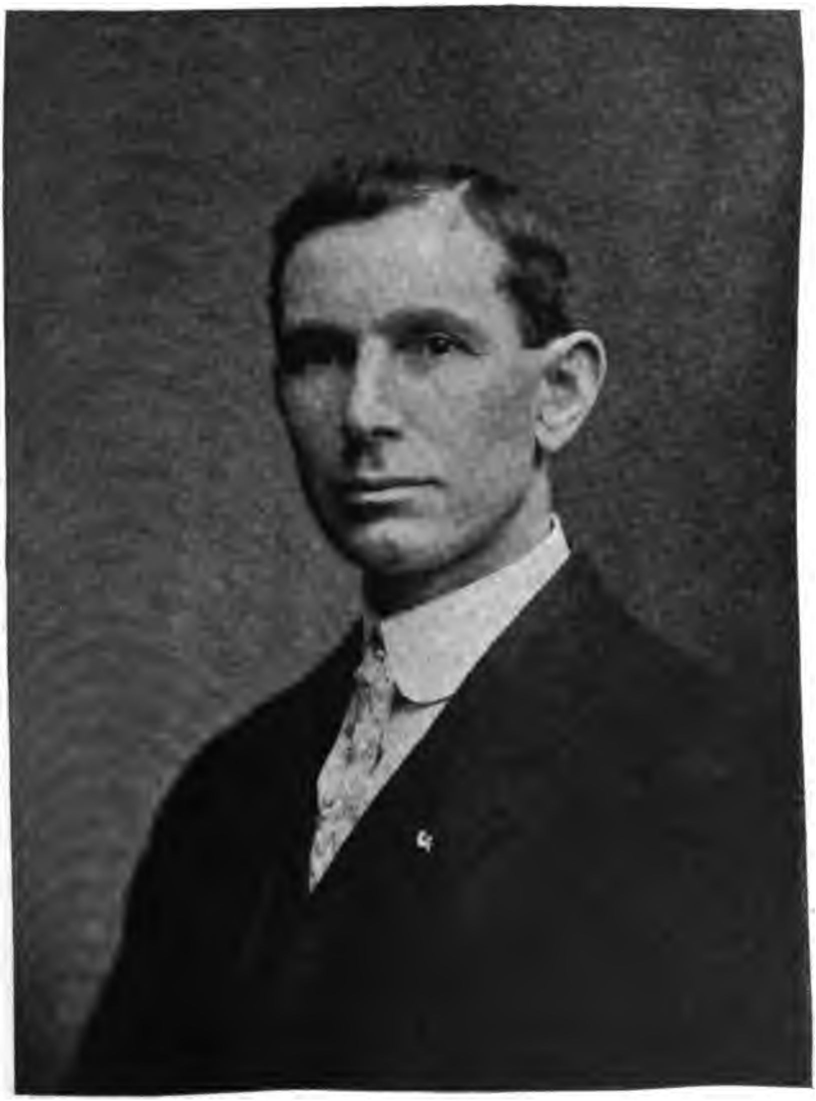

Fig. 489.—ALBERT E. MANNING, Secretary, New York State Dairymen's League

market. When the market is not attractive for the liquid form it may be put in some manufactured form; thus at all times securing for the producer the largest return for his product.

The large membership of the league, distributed over so wide a territory, has already enabled the producer, through the organization, to exert a most salutary influence upon legislation and board of health and municipal regulations. While we realize that milk, as well as every other food, should be handled in a most careful and sanitary manner, still we believe the attention that has been directed to the danger of using milk as a part of the diet has been overworked. It is a miracle that so many are alive to tell the story. It apparently is really dangerous to be alive, and our only safety is to follow the cattle producer and handlers of milk with a spray pump, brush and can of disinfectant. It may be consoling to some of my hearers to mention a few findings of some of the most eminent students of bovine tuberculosis:

1. That only a small percentage of cattle known to be tuberculous secrete milk containing tubercle bacilli.

2. Bovine bacillus is responsible for certain types of tuberculosis in infancy and early childhood, but rarely found in adults. So most of my hearers have passed the danger line.

3. Cases of lung tuberculosis in human beings, due to bovine bacillus, are extremely rare. I believe most people, when they hear of children having tuberculosis of the bovine type, jump to the conclusion it is of the lung type, which is not true.

Before closing, I believe it proper at this time to mention another possibility of the league and also of all producers and consumers of milk; namely, the production of milk for importation should be subject to the same inspection and sanitary regulations as to equipment and methods as is required of the United States producers. I fear this is not at all times required, and may not be easy to enforce; but with the special attention that has been directed toward securing a more healthful and pure milk supply, the importation of milk and milk products becomes a public health proposition as well as a commercial one. This would seem to justify the placing of some restrictive tariff upon milk and milk products, as well as requiring a guarantee of its purity and healthfulness, and that the agricultural and health departments of the federal and state governments should have and rigidly enforce necessary regulations.

The President: This is an important subject and we are going to have a discussion of it by Mr. F. W. Sessions.

Mr. Sessions: I feel our president has gotten me into a little trouble here. When I first heard from him, I understood I was to prepare something on the clarifying of the milk situation and I have nothing to say in reference to the Dairymen's League. I am afraid I know very little of the Dairymen's League as such, and its operations. With your permission, I shall read what I had prepared upon receiving the letter from the president. It may not touch upon this particular question as you think it ought to, and may not be worthy of your consideration from any standpoint — but such as it is I shall give it to you.

DISCUSSION OF THE MILK SITUATION

F. W. Sessions

In a discussion of the milk question we must consider the interest not only of the consumer as an individual, but also his duty as a part of the state's population, and his relation to the question of public health and safety.

Considering its sustaining power, milk is probably the cheapest food product to be obtained, yet no article of food receives so little attention.

The average consumer seeks the cheapest milk to be obtained without regard to richness, purity and cleanliness, or the cleanliness of the stables and healthfulness of the cows.

Yet much milk that is sold contains disease-spreading bacteria and comes from cows, many of which are tubercular, kept in unhealthy stables and cared for by careless attendants.

There is no doubt but present conditions should be corrected; but the bringing about of the necessary changes to insure production of the required quantity of pure, clean, wholesome and safe milk will necessitate a departure from present methods — changes in many stables, milk rooms, much additional labor and a materially increased cost of production.

A first step in changing these conditions is apparently the education of the consumer to buying none other than clean, sanitary milk, and to taking proper care of it after it is received.

The average housewife when placing an order with the market does not ask for just meat; she has definite ideas of the cut she wants, based on its nutritive value and its current price. She does the same with flour. If the sample furnished her by the grocer does not present the value she thinks it should she asks for a new kind the next time, and so on with the food essentials.

But too often when it comes to milk, why milk is milk — white fluid — and there her interest stops. She does not question the big range of difference between clean milk and the common variety, the latter representing by far the larger percentage of milk produced in the state. There is always room for a campaign of education to demonstrate this point, and when it is thoroughly understood there will be none other than clean milk in demand.

This immediately introduces the other side of the question — the producer.

The dairy farmer today is not obtaining a fair return for his labor and on his investment, and cannot be expected to eliminate the tubercular cattle from his herd, change his methods, and increase his labor and cost of production, unless some way can be devised for insuring him a better price for his product to give him a proper return for his labor and capital invested.

There are about 597,363,198 gallons, or 2,389,452,792 quarts of milk produced annually in New York state, valued at $77,807,161, or 3¼ cents per quart. Only a small part of this vast quantity is sold by the farmer directly to the consumer, the greater part being sold to dealers or distributors who charge the consumer the same price per quart winter and summer, yet pay the farmer much less in summer than in winter.

The dealer seems to be quite successful in looking after his own interests, so that he may be left without consideration with reference to the interest of the consumer and producer.

To insure the safety of the consumer we must first have healthy animals and sanitary conditions.

In the state of New York there were officially tested in:

1910 — 14,181 animals.
1911 — 17,909 animals.
1912 — 21,421 animals.
1913 — 18,668 animals.
1914 — 18,284 animals.

The number of reacting animals was:

1910 — 3,029 — or 21 per cent.
1911 — 2,993 — or 19 per cent.
1912 — 4,178 — or 19 per cent.
1913 — 2,891 — or 16 per cent.
1914 — 2,139 — or 12 per cent.

Most of these tests were of herds that had been previously tested; herds owned by those who had been making an effort to eliminate tubercular animals.

It is safe to say that if all the dairy cattle in the state were tuberculin tested during the year, the percentage of reacting animals would equal 25 to 30 per cent.— probably the higher figure. And, as there are in the state about 1,151,284 dairy animals, it would mean an elimination of from 287,831 to 345,385 animals at a fair valuation of from $28,782,100 to $34,538,500, of which the state, under the present system, pays back about $46 per head, causing an actual money loss of from $14,000,000 to $17,000,000.

It, therefore, can be easily understood that drastic measures compelling the immediate elimination of all tubercular animals would be impractical. It would cause the financial ruin of the dairy farmers of the state, create a milk famine, and raise the price of milk to a point above what the ordinary consumer could afford to pay; yet the elimination of unhealthy animals from the dairy herd and the production of milk under sanitary conditions are not only important to the public and the individual consumer, but also to the producing dairy farmer.

It would seem to me to be for the best interests of the farmer to recognize this fact and forestall drastic legislation that may be brought about by the consuming public, by getting together and devising some plan for bringing about the desired results without

Fig. 490.— F. W. SESSIONS, Utica, N. Y.

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causing so great a loss and the ultimate ruination of dairy business and interests.

The State Department of Health has published certain rules for the production and sale of milk, providing for the inspection of dairy animals, buildings and utensils, and the grading of milk offered for sale, according to the result of such inspection,— a step it would seem in the right direction — but the inspection and scoring under these rules are to be made by the local health departments, and municipal governments seldom provide adequate facilities or funds with which to carry on the inspection in a satisfactory manner.

Would it not be better for our legislature to provide for the performance of this work in a uniform manner throughout the state, under the direct supervision of the State Department of Health or the Department of Agriculture, making the cost directly chargeable by the state to the cities, towns or communities for whose benefit the work was done, the amount to be provided by them through their regular tax budget?

To provide for the gradual betterment of unsatisfactory conditions and gradual elimination of unhealthy and tubercular animals might be arranged for by requiring a prompt physical examination of all herds, and the elimination of all animals shown by such examination to be dangerous as disease spreaders. Such examination might be followed by gradual and systematic testing of all herds with tuberculin, such tests to cover a fair period of time so as to reduce to a minimum the financial loss to the farmer.

To minimize the burden involved the state might provide a more generous appraisal and prompt reimbursement to the farmer for animals removed. It might be provided, as under the present rules, that certified "A" milk, bearing a low bacteria count, be produced from tuberculin tested animals under sanitary methods.

These suggestions may not all be practical, and they may not offer a true solution of the problem, but they seem to me to be worthy of careful consideration, and I believe it to be important that the producers should, by cooperation and united effort, work out a plan to solve the question to the best interests of all.

THE PRESIDENT: When the committee had practically prepared the program for this convention, they looked it over and said, "That is a good program. There are a lot of good me there and they have practical subjects; we are not afraid to go t a farmers' convention with a program of that kind." But th theatrical fellows make up these good programs and then the want to know, "Where is our star." They were all so good w could not select among them a star. We fortunately had at con mand a man who, more than any other one man in the state, i acquainted with the agricultural talent and agricultural abilit of the United States. He is a personal acquaintance of mine an we called him in and told him a little of what we wanted. H said, "Well, now, you want the very best? You won't be satisfie with anything at all until you get the best there is?" "That i what we want," I replied, "we have the best now — we war something that is superlative." His reply was, "Call up J. E Hale and see if you can get him." I called him up, then I pu my hand over the telephone and asked my friend, "What are w going to ask him to talk upon?" He said: "Ask Hale to talk o anything he wants to. No matter what he says, Hale will be in teresting." We have Hale and it is my privilege to introduce hin

AGRICULTURAL OPPORTUNITIES IN THE EAST

J. H. HALE

Brother farmers, it is really a pleasure to come over the borde line and meet with my neighbors of New York State, because yo are always interesting; you are always instructive, and you hav always been helpful to me as a brother farmer and a neighbor.

My subject is given on the program as "Agricultural Oppo tunities in the East," and just at the present time I have a feelin that there is a wonderful opportunity in the East. Having bee born and reared on a New England farm, for twenty yea past worked a large plantation in the far south, and recently r turning from a trip to the Pacific Coast in the interest of agr cultural matters, I have, perhaps, just at the present time a broade feeling toward our opportunities. There are different conditio pertaining in the East and the South and the far West, and yo know the old story — that you can always tell where a farme comes from if you can see him dining in a hotel in town. If h comes from the South, he will tuck his napkin under his chin; if he comes from the West, he will tuck it in his vest; and if he is an Eastern Yankee, he will tuck it in his pocket. That applies very largely to our eastern conditions. We are a little too small and a little too narrow and want to grasp on to the napkin that is in sight the first thing, and do not look to the broader things that may come on the table later.

The New York State farmers have been a big help to me. When I was a small boy digging my living — helping my brothers and sisters and mother to obtain a living out of a small New England farm — I read in one of the small agricultural papers published at that time, that you had a certain farmer in western New York who had become rich farming. Down in Yankee Land the idea that a farmer or anybody could get rich farming seemed a strange fairy tale, like some that we read in the yellow journals of agriculture at the present time.

Borrowing some money from my older sister, I took a trip out there — sat up all night to save money — and arrived at Lockport in the morning. I walked out to the J. S. Woodard farm and in a plain country boy's way told him I had heard that he was rich. It pleased him to think that he was rich. He did not know it, but the agricultural fellows had put it in the paper.

He drove me over his farm and showed me around, and at noon took me into the house and gave me a good dinner. He treated me very nicely. After dinner he said, "John, you have come out here with a serious purpose and I want to help you." Then he continued, "This farm belonged to my father. Father was a rather successful farmer; he had cattle, grain and hay, and was rather more thrifty than his neighbors. One day as we were sitting at dinner, a load of hay went by. Father jumped up, went out and bought that load of hay, bringing the farmer in to dinner. Some time later I heard my mother chide him for buying that load of hay when there was plenty of hay in the barn. I later asked him why he had bought it when he had so much in the barn. He said, 'Jabez, you will own this farm some day and I want to give you a bit of advice. Never sell a load of clover, and never let a load of clover drive by this farm; then you will be prosperous.'"

That is the lesson I received nearly fifty years ago from a Ne York State farmer. I feel sure that whatever success has com to me in agricultural life, the seed of it was planted there b J. S. Woodard, and it is clover seed. We found later on throug scientific men and through the experiment stations, that we coul inoculate that seed and grow clover abundantly on all our lands and we are now doing that.

That was the start. This last fall I went over on the Pacifi Coast. On the way over I received another lesson. When I wa a boy in school, the maps showed a great American Desert i the territory now occupied by the great states of Kansas Nebraska, Oklahoma, part of Texas and New Mexico. There wa the great American Desert beginning fifty or seventy-five mile west of the Missouri River. As a small boy I heard some of th men who trucked goods away out across the desert, over the Sant Fe trail, tell stories of the buffalo and the Indians in that country It was a wild tale to me as a young boy. Thirty-five years ag I went across that country. It was a barren country — a deser country. Twenty-five years ago, induced by the railroads an others, I saw where homes had been attempted to be establishe for 300 miles; it was a struggle but there were men there. Fiv years later many of them had actually deserted their homes; bu some had stayed there. Ten years ago I saw coming prosperity Now there are splendid towns, good roads, many fine farmhouses silos, great stacks of alfalfa, thousands and thousands of sleek, fa cattle, sheep and hogs, and other evidences of prosperity. I every small town there the finest building was the public schoo house.

But what had made all this prosperity? You may say irriga tion; but above all, it was the planting of the big twin brothe to clover — alfalfa. And now that great American desert ma not be blossoming like a rose, but it has " rose " up and blossome with alfalfa, and Kansas is a land of peace, progress and plenty

This last year I went into Southern California. When I wa there twenty-five or thirty years ago, there were certain fine land well situated for irrigation that were being planted in citru fruits, but most of the land was not considered suceptible of ver high development or very great value, although at that time th price values far exceeded the actual worth of the land.

FIG. 491.— HON. J. H. HALE, SOUTH GLASTONBURY, CONN.

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Last fall I found ten thousand acres, away out of the so-called successful line of twenty-five years ago, growing splendid crops of oranges, lemons, English walnuts and fruit crops of almost every kind. I saw splendid homes and towns, and evidences of prosperity on every side. Irrigation was the one main source of their larger development. But wherever I went, the most successful men were those who were growing alfalfa.

I want to say a word about that western country. Twenty-five years ago, in the Eleventh Census of the United States; I had charge of some special horticultural investigations, one of which was the citrus fruit industry of the country. I chased all over the country and gathered all the information I could on the work we were doing, having personally covered Florida and spent some time in Southern California. We had counted all the trees in the orchards, and I went back to Washington and issued the first bulletin. Being a farmer and a horticulturist rather than a statistician, I only went into the work for the information I could get out of it. I was too poor to travel on my own account, and if Uncle Sam would pay the freight, I enjoyed it.

When I came to write up my first bulletin, I bubbled over and wrote a yarn about orange growing and lemon growing, and their possibilities, as though I were taking to a gathering of horticulturists. Among other things I said, "If the trees that are now in the orchards of California are fairly well cared for, and if those in the nurseries are planted out and are fairly well cared for, there is a possibility that in ten years from now California will ship ten thousand carloads of oranges." I believed it. Not twenty-four hours after the bulletin was published, that was printed in every daily paper in California. It was not twenty-four hours later when I was summoned to come down to the Bureau of Census and show cause why I should not be fired or killed. The California representatives from both senate and house were there and they said, "If the information goes out that it is possible for us to have ten thousand carloads of oranges in ten years, nobody would buy our land. Withdraw that bulletin, kill the fellow or do something."

The bulletin could not be recalled, but I recall something. Ten years later California shipped 21,000 carloads of oranges and did not go bankrupt, and people kept going there and buying the land and extending orchard planting. Last year they shipp over 40,000 carloads of oranges, and with the oranges on the tre at the present time, and the lemons, they will ship more tha 50,000 carloads this year.

These oranges would not be worth picking were it not for the fa that the growers have organized. They are pulling together, ju as Mr. Cook told us yesterday. There is a probability of 100,0 carloads there in a few years. It will take quite an organizatio a thorough system, to handle 100,000 carloads of oranges. B what I wanted to say was that the splendid marketing organiz tion of California today is managed by a New York State boy - G. Harrold Powell — a boy born and trained on a New Yo State farm, then trained at Cornell, then working in the Depar ment of Agriculture at Washington for a number of years und Dr. Galloway and men of that type. He went out to Californ to work for the Federal Department of Agriculture and showed such skill in the particular line he was working in th they said, "Come over to us; we can pay you higher wages tha the Federal Department of Agriculture can." So they employ him at a large salary, and he is managing the marketing busine and is distributing fruit all over the United States.

Every large community there has organized. They own the packing houses. They inspect their fruit and pack it under rig inspection, and then once a week the directors of each local ass ciation meet with the manager in Los Angeles. They talk ov business in a business way. I have been in business meetings some of the greatest corporations in this country, but I have nev seen such a clean-cut body of business men — acting so prompt and right to the point — as are the directors of the Californ Fruit Exchange with Powell as their leader. They think and a in millions because they have put together their little boxes oranges until it makes an immense traffic.

From there I went on up into Oregon and Washington to stu their apple industry. Why, they have not any better apple la than we have down here! They think they have, but that do not make it. They give more care to their orchards than we d because they make a specialty of it. They have nothing else to d

They prepare the land well, they select the very best trees and they spend the whole year round thinking and studying and talking about their orchards. They are all looking to the East for their market. Those fellows from the West are brighter than we are. They come here for their market. It is right here under our very eyes and they see it three thousand miles away while those of us who live here do not. That is a peculiar business proposition. If men can go three thousand miles for a market and make money, what is the trouble with men in the same line of business right here on the spot?

I was interested in their methods of culture, of pruning, spraying, packing and handling, but above all things in cooperation. They were pulling together. They were working together. They had their great storage houses and packing houses — system all the way through, although rather to many selling agencies.

But those brothers of ours over there in the Pacific Northwest are planting fruit on land which they think, or at least thought a year or two ago, was worth $500, to $800 and $1,000 an acre, and it takes from 40 to 60 per cent. of the sales price of their fruit to get it on the market. At one time many of us were foolish enough to quarrel over the protective tariff in this country and make it a big political issue. There was never a protective tariff on earth as high as the one we eastern farmers have on our farm produce in the question of transportation between the far West and our home markets. We have this protection if we would only utilize it. The land-values, or so-called values, are six, ten and oftentimes twenty times higher than land of equal or greater productive value right here in the East. There is no question about it. I say that advisedly.

I told you I was born on a farm in Connecticut and have lived there all my life. Something over twenty-five years ago one of my neighbors got an idea of going somewhere and doing something in a big way, and he wanted to go to Florida and buy orange land. He sold his big farm for $25 an acre. He went to Florida and paid $200 an acre for land to plant oranges on. Great business! I get oranges from that grove occasionally. They are fine, but they are selling in the Hartford market at the present time for $2.15 a box — 150 or 200 in a box. I wanted to get some

Baldwins I have in cold storage, which were raised on my la because they are better than the one I have here. They lo good and sell well. This apple was grown on $25-an-acre la and sells for $2.50 a box at wholesale — 80, 88 or 100 to the b This orange sells for $2.15 a box, for 200 in a box — twice many in a box — and then this fellow had to pay sixty cent box to get his fruit to market. These apples cost me five cent box to reach about ten million people. Those who can figure see the difference. The oranges retail in the market for 30 ce a dozen, the apples for 50 cents a dozen. The California ora land from which the orange I hold in my hand came, cost $600 acre in its raw state. It cost my friend about $23,000 to put an irrigation plant for twenty acres of land, and his oranges selling for $2.15 a box, retailing at 30 cents a dozen against apples at 50 cents a dozen.

Where is the Eastern farmers' opportunity? Right here apples, peaches, pears, plums, grapes, small fruits and vegetab of every variety. There are plenty of other opportunities about us everywhere. Of course, we get our different points view about these things. People in Florida are reasonably w satisfied; those in California think that is the finest place earth, but they would like to see a little more money for th fruit.

Population gives value. Why is land higher on Manhatt Island than it is in the back counties of New York State? W does it sell for more per square foot, almost per square inch, some parts of that island than it sells for per acre up-state? Po lation makes values, and there are forty million people with twenty-four hours of New York. That is what gives value eastern farm products. The people are here. They are friends and neighbors. They want high-grade perishable p ducts that we can deliver better than the West. These peo are here and it is our business to feed them. They want the b products that can be produced in the best possible manner, a they are willing to pay for quality. Give them a higher gra and the finest quality, and they will take all we can produce prices that I believe will be profitable to us. We have this wond ful opportunity in their being our friends and our neighbors.

What is the trouble? Our opportunity is too great. It is so great we do not appreciate it. The eastern farmer, particularly by force of circumstances is a capitalist, a laborer and a business man. Ninety-nine times out of a hundred he forgets that he is anything but a laborer. He spends his time in hard work on his farm. He forgets his capital should earn a dividend. Let us quit laboring and do more or better business. It is rather singular, but it has gone out to the world that we are not business men.

Unfortunately, I am a director in a bank from which I have been borrowing money all my life. Monday of this week I attended a meeting of these directors. One note for $1500 was passing by when one of the directors said, " Let me see, what is Bell's business?" The President immediately spoke up and said, " He is not a business man, he is a farmer." Then they all looked at me with sort of an apology. I said, " you have simply acknowledged what the rest of the world thinks of the farmer, that he is not a business man." Those western fruit fellows are business farmers, because they have to be so or quit the business. Any one can live on an eastern farm and you can not starve him out, even though he disregards almost every rule of good business.

Now, what is our opportunity? Forty million people to feed — that is our opportunity. I have never spent any money on rum and tobacco, but I have spent all I could get on travel through all the agriculture sections of America, and I say it advisedly, because I believe it, that nowhere in America are there more favorable soil or climatic conditions for general agricultural and horticultural productions than in the northeast corner of the United States. It is up to us to produce high-grade perishable products and then find the best business way to dispose of them. I have not a word to say against the middleman, but where we can get by him, where we can get by the wholesaler and the retailer and get nearer the consumer — there is our greatest opportunity. It takes a business man to find out how to do this.

I am not here to tell you what you shall do. That is your business, and in the first place it is to do those things you like best. If you like cattle, take up some branch of that industry; if you like fruit, take up that particular branch, but in the sale of your products try to come nearer to the consumer and get all

there is out of it for yourself. That is your business. If it mean
cooperation with your friends and your neighbors to reach th
markets in the best possible condition, that is your business; i
is the business of your friends and neighbors to go in with you
Do not think you can get along selfishly in this world. You hav
got to help the other fellow all the time.

So far as possible finish the products on the farm, whateve
they may be. Do not let the other fellow buy them in an unde
veloped state and finish them. There is more profit in the finis
and polish than anywhere else. I know of one eastern farm o
only twelve acres; a father, mother, two sons and a daughter mak
a good living from it. They spend the whole summer in planting
cultivating and harvesting every kind of product grown there tha
can be made into pickles. When fall comes, mother and the boy
and girl make pickles and father becomes a commercial salesman
He is a traveling man five or six months in the year and goes t
all the retail grocers. He is a general farmer, but is his own sales
man. He is a farmer, then manufacturer, then a salesman. H
gets all there is in it and his family lives splendidly from twelv
acres.

Some years ago I knew of a farmer within seventy-five mile
of Albany, who was a producer of high-grade small fruits. H
spent his whole time, money and thought in the production of suc
fruits, and in packing and shipping them. He made a reputation
and there went into every basket of fruit the name of the farm
name of the variety and statement “ price always five cents abov
best market.”

One year in changing about his crops and doing away with a
old strawberry bed, he planted potatoes and grew a magnificen
crop in a year when fifty cents a bushel was all they would bring
It did not look good to him. He went down to Boston, and calle
to see two or three of the high-grade grocerymen who had handle
his fruits in the past, and where he had made a name and repu
tation. He told them he had some potatoes to sell, and showe
them samples. He had some pretty good potatoes to show them
He said families ought to buy good potatoes and buy them i
bushel lots.

After talking it over with the grocerymen he decided what h would do. He went out and bought five hundred clean new sacks at four cents apiece and shipped them back to his farm. He stopped at Pittsfield and arranged for the printing of some tags advertising his farm and his potatoes. Then we went home and, to the horror of his neighbors, began digging those potatoes, hauling them to the brook and dumping them in. He hired boys to wash them. The neighbors said, "Everybody knows that potatoes will not keep if you wash them." He did not want to keep them — he wanted to sell them. So he washed them and shipped them down to Boston, and sold for one dollar a bushel. They netted him eighty-five cents a bushel. A business farmer.

Your city friends will tell you you do not grow sweet corn any more. You do grow sweet corn but you do not know how to deliver it to the customers. Chemists will tell you that the minute an ear of sweet corn comes from the stalk the sugar begins to turn into starch. A farmer living near a city or village who will grow fine sweet corn, and have some method of quick transportation to the city home direct, by means of which he can guarantee to deliver fresh-picked *sweet* corn an hour or an hour and a half before it is put on the table, will find that the people who buy it will be delighted to pay a liberal advance over marketing rates and feel that they are getting something worth while for their money.

There is a tremendous chance to sell perishable farm products direct here in the East. The money that our states and towns have been putting into good roads has annihilated distance. Ten, twenty or twenty-five miles to go to market used to be a long distance for a perishable product. Now, twenty or twenty-five miles is much easier than five miles a few years ago. There is an opportunity with these good roads and the automobile or truck; and there is also the opportunity to advertise our products for sale direct at the farm and so bring people from the cities and villages out to the country in autos and sell to them direct. Then there is the parcel post; we have not begun to utilize that yet.

Above all things let us advertise. Farmers as a class are poor advertisers. The most successful business men are men who advertise liberally and well, and the farmer who lives within a reasonable distance of a city, town or village, and has products to sell, should take space in the local papers and advertise his products, changing the advertisement from week to week as the proc comes along. Then he should deliver his products better tha has agreed — always do better than you have agreed, ha your product so fine as to tempt the consumer to pay eno more for the things to pay the advertising bill and l you a good big profit. That is business. Those people who selling package goods know that. Nobody knows how many dred thousand dollars a year the National Biscuit Comp got by inducing the housewives to buy cardboard and paper w pers in place of crackers. Why not cash a little of that foo ness for the farmer? If it is business for the other fellow business for the farmer. Think of selling pork for thirty c a pound as they do in Deer-Foot sausages! Under a dozen ferent products and names they are doing that sort of busi with manufactured food products. The newspaper that ca the advertising is satisfied; everybody is satisfied but the pig, he can't squeal.

So it is with the various fancy brands of bacon. You w not go out in the market and buy bacon at sixty to seventy cants a pound; but put a "huckleberry-nut" name on it, it in a glass jar and you pay about seventy cents a pound f and are satisfied.

It is up to us, to farmers as business men, to avail ourselve judicious advertising, whether it be in the local papers or any o legitimate way, to put our wares before the public in a clear, cise way. Any sort of product is susceptible to some sort of ad tising. It may be a good sign in front of the farm, possibly personal letters to certain families in the towns and vill nearby, inducing them to come out to the farm and buy tr They love to come out with the automobile and the good ro Our city ladies are almost hunting for some place to go. Ha good big flower garden, and let them freely take home all flowers they want. Incidently, they will buy berries, vegeta poultry or something else you have for sale. You and they are to make the trade and everybody is happy. There are pe who want to spend their money, and if you can induce the come out to your farm, and you are a fairly good salesman, can get part of their money, and they are just as well or b off than if they bought inferior products in the market at less price. We sell from three to five thousand dollars' worth of farm products at the farm every year. I have a neighbor who sold ten thousand dollars' worth at his farm. He is a good advertiser.

Another thing, the labor problem is troubling the agriculturists all over the country, but there is no part of America, except in the far South where they have the negro labor, where you can get as good labor as quickly as you can in the northeastern part of the United States. It may not always be very efficient, but it is labor of some kind. The western farmer often cannot get extra labor at any price.

The city papers and some of the yellow journals of agriculture that print pretty pictures and pretty stories are leading a great many people in the cities and towns to believe that the farmers are all getting rich; leading them to believe that we are taking extra advantage of these business opportunities I have been talking about — that the high prices are all going into the hands of the farmer. This is resulting in a " back to the land " movement of considerable magnitude. And there is one good thing about it — when you become so rich that you do not know how to squander your money, there is no place you can do so more quickly than on a farm. When you are broken down in health and can not succeed anywhere else, you can succeed on a farm. Why, any greenhorn can go right out and make a moderate living on a farm! Especially if the old mother is still there.

In Monday's mail I received two letters. I shall read one, and perhaps the other. This is from Brooklyn:

> Indirectly I was referred to you on the subject of apple orchards. I wrote to my friend, Mrs. ——— of Hartford, and asked her to find out about farms for me, and through a friend of her's she heard of you, so I am taking the liberty of writing you on the subject. I understand you will be delighted to give anyone interested all information and advice.
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> Now, the facts are these: my only daughter has just become engaged and the young people are anxious to become farmers, and raise apples, cows, pigs and chickens. I think they would want about fifty or sixty acres, and are open for suggestions and advice. Neither of them has ever lived on a farm, but I feel certain that the life will suit my daughter as she and I have often spoken of having a small place of our own in the country. Now that the young man has entered the field, his ambition for years has been to have a farm and he is ready to study along that line. It seems to me they ought to make a success of it. He has a friend ten or twelve years older

who recently married and wants to locate near, so we are really on the out for two farms.

Excuse me for apparently taking you into family conclave, but I ha explain a few points so you will know what we are really hunting for.

I know what they are hunting for — trouble. There you it, a lovey-dovey pair down in Brooklyn who are thinkin bucking up against you farmers and showing you how to d It is so lovely to have chickens and pigs and milk and all t beautiful things — all without experience. I wish them e success. And it is just possible the young man's business perience may be worth more on the farm than in the city.

The other letter is from a couple of young men down on Br way, New York City, who are saving up their money. They to buy a farm. It must be cheap because they haven't very n capital. They never saw a farm in their life but they have h of the money we are making, and Broadway does not look to them any longer. They have been led to believe the th I have been telling you.

There are hundreds in all walks of life who are thinking a going on a farm who are going on the farms because they see opportunity which you fail to see. They do not know the struggle before them. Many of us have gone through the struggle and know the hard side of farm life, and if we w only wake up to the business opportunity that is here and these people see, we might find eastern farming the greatest ness on earth. The men who are following business lines, e cially in salesmanship, are making a greater profit on capita vested than almost any other class of business men in the c try. Lands near where these thirty million people are living lands of opportunity and promise for many a farmer.

Our experiment stations, our colleges and our institute w ers, who have been trying this uplift work, have been spending much time on production and not enough on salesmanship. is the use of producing enormous crops if we do not know ho sell them? Do you suppose our successful manufacturers in A ica today, who are turning out fine goods, would ever succee they depended upon commission men to entirely handle t goods? No, they have their own sales departments. We wa give up studying production for a time and devote our time to the problems of better salesmanship — the business side, the money making end of our farm business. We must wake up and be business farmers, and the first step in that line is cooperation. Cooperation: I mean intelligent business cooperation, a cooperation where you are willing to put your hand in your pocket and take out some money to start it.

I was much interested in the talk of our friend Cook yesterday, but I wanted to take issue with him on one thing. He said they were organized to fight the canners. Never organize to fight anybody, especially in a business way. You can not sell goods at a profit to the customer you are fighting with. Brother Cook did not really mean what he said. They organized to deal intelligently and fairly with the canners, and secure the best possible price for their product. Do business with your friends and make every customer a friend, at the same time being a friend to every customer.

We want more training in the handling of our products. We want uniformity in grading and packing. That is one thing I learned in California. You have a New York State apple grading and packing law. I shall show you some apples that came from a New York State Standard A barrel, minimum size 2½ inches. I got nearly a peck of the low grade out of that same barrel. Probably this man did not get half what they were worth because this was his idea of standard. The farmers, while intending to be honest, are the most crooked lot in the world, because they do not know any better, having learned their apple packing from the old-time apple speculator who packed as though no one was ever to see the middle of the barrel. Consequently they let anything go in.

I am a farmer and you are a farmer, but you know we are a lot of dubs in a business way. The point I want to make is this, had some inspector of a cooperative apple growers' association had charge of the packing, these apples would have gone to the cider mill, and the balance of the barrel sold for more money. The owner may have been a small orchardist who was so busy working that he did not see the laborer when he put those low-grade apples in the barrel. He may have been at that time heading up a barrel himself, working so hard to earn $1.50 a that he lost $10 by not supervising the business end of orcharding, from which his profit was to come.

We want cooperative cold storage houses in many of our munities when we have products enough. Our business op tunity is here. It is for us to accept it or not, just as we will do not know how many here are doing it. Some are, but nc many as should. Is it not about time to wake up?

THE PRESIDENT: We will now hear an address on the sub of Farm Hygiene by Dr. Lydia DeVilbiss, of the Division of licity and Education of the State Department of Health.

FARM HYGIENE

DR. LYDIA DEVILBISS

I believe that I can lay claim to being a farmer's daughter, if one's neighbors are to be believed, my father was "a farmer from town with more money than brains." Fortuna my mother was a better farmer than he was and between t they made an old clay knob blossom like a garden.

My mother always maintained that the farm was the best sible place to raise babies and to bring up boys and girls. than likely most of you here are firmly convinced that that is I believed it myself until about two years ago.

Some of you are familiar with the work for better babies moted by the American Medical Association. For many y the farmers had been bringing the finest of their farm prod to the fairs to be judged and awarded prizes. No one though entering the farm's most important crop — the farm babie until a western woman suggested it. Then everyone wondered we had not thought of it before. But when they brought the bab they were amazed to find that there was no score card nor sta ard of measurements for the American baby. There were ple of score cards and standards of excellence for all the farm anim and for the fruits and vegetables, but none for the boys and gi So the doctors were called on to take hold of this problem soon they evolved an excellent score card for babies coverin thousand points.

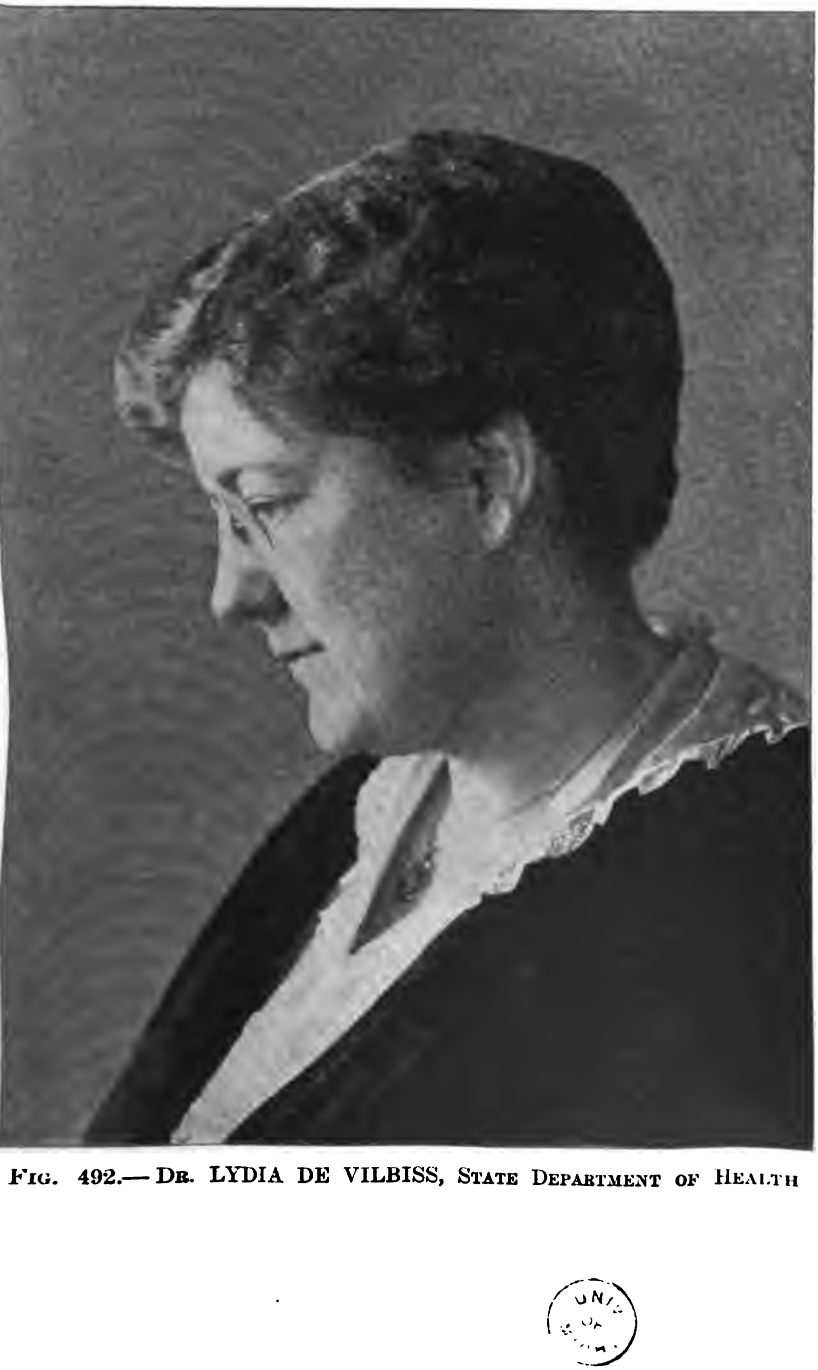

FIG. 492.— DR. LYDIA DE VILBISS, STATE DEPARTMENT OF HEALTH

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farmer folks and the city folks brought their babies. Big , small babies, smiling babies, crying babies, babies of all nd all sizes. When the final scores were computed and the s made, it was found in practically every instance that the abies had carried off all the honors and that the country had come in second and third. From every part of the y — north, south, east and west — came the same kind ords; the city babies were carrying off all the honors.

r is that all. In the great state of New York more than) babies were lost last year, half of which loss, at least, was preventable diseases. When the reports were analyzed, it ound that the highest death rate was not in New York City ts large foreign population and congested slums, but in the y districts. The reason for this condition can be summed four words, "lack of intelligent care."

l the one important reason for this lack of training and as been forcefully brought forth here. It is true that the d States Government has poured forth lavishly millions of s to better agricultural conditions. It has been stated that ear alone, four millions were expended in experimental and tional projects. Compare that sum for a moment with the y or twenty-five thousand appropriated for the children's u. Millions for the farm produce and thousands for the en; dollars for the hogs and cucumbers and pennies for the .

farmer's daughter learns what she knows about the care home and little children from her mother. How many rs' wives are excellent mothers and competent housewives? while the mother in the home is teaching the daughter her ent methods, she is also teaching her her wrong methods of things, and her mistakes.

one of the child welfare exhibits in New York State, a n came in and immediately picked up an old-fashioned g bottle with a long rubber tube labeled, "Baby Killer." at's this?" she asked the nurse in surprise, "I am raising aby on that kind of a bottle." "Where did you get it?" the nurse. "From my mother," was the reply, "she raised the same bottle."

Scientific methods are seldom evolved in the workroom. are worked out in the laboratory. We will not have scientific making and scientific baby raising until they are made the ject of scientific research, and the results are brought int public school curriculum.

I believe in higher education for women. But to be able t problem in calculus will be a small comfort to a woman buries her first baby because she did not know that bananas not good for it. I believe in higher education for boys, al they care for and can use to advantage, but such educatio be a failure if it does not fit him to be a useful citizen, a husband and a successful father.

We have gone a long way from the little red schoolhous the three R's. There have been many X's, Y's and Z's intro into the school curriculum. Some are good, some are bad, are perhaps indifferent. We will need to keep what is goo discard the useless. To the three R's we need to add such s as will promote efficient, happy and healthful citizens; know that will enable the individual to preserve his own good h that will enable him to make and maintain a happy home that will fit him to be the parent of a better generation. then, is the fourth R — the R of Right Living.

Meeting adjourned.

AFTERNOON SESSION

Meeting called to order by the President.

THE PRESIDENT: When we assume to instruct or organi ought to see to it that the agency that is doing the work is organized or constituted so as to be an inspiration and a for their instruction. This is the scope of the work before Cook in the correlation of the agricultural work of the state is going to make a report on some committees for that purpo which he is chairman.

DEAN H. E. COOK: This report will be very brief indee possibly might have been better had it been filed with the sec without reading. This is really a report of two committee is the report of a special committee appointed one year ag the second is that of the standing agricultural educational committee appointed by our president. I happen to be chairman of both committees.

REPORT OF AGRICULTURAL EDUCATIONAL UNIFICATION COMMITTEE

DEAN H. E. COOK

At the last meeting of the State Agricultural Society, a plan for the unification of the agricultural education and regulated law control of New York State was presented and discussed. The plan, outlined briefly, placed all of the institutions serving agriculture in our state under the Board of Regents.

This plan was prompted by the desire to place the three divisions of agricultural service, namely Regulative Law, Extension Work and Educational Institutions, on a sound and permanent basis. The one great basic industry of our state should not be subject to anything in the nature of shifting and change. Agriculture is not fleeting or passing. It never ceases and cannot cease if man is to live. There is a cumulative and progressive atmosphere surrounding agriculture, which is not found associated with any other industry.

Education is accepted by men and governments, and only in detail is it subject to debate, and, therefore, finds itself permanently fixed into all of our policies. The administration of agricultural education should be no exception.

Shortly after the meeting of this society in 1914, the same plan was presented to the state grange at the Poughkeepsie session, and referred to the executive committee. Later the President of this society appointed a standing committee on agricultural education. Another committee was also appointed from the State Advisory Board to act upon the same general problem.

After consultation, the above-mentioned committees came together in Syracuse September 3, 1914. For convenience of operation these four committees were organized into one committee. Following a general discussion of plans proposed for unification, a sub-committee was appointed as follows: Calvin J. Huson, Thomas E. Finegan, Boothe C. Davis, B. T. Galloway, W. H. Vary and H. E. Cook.

This sub-committee met in Syracuse October 26, 1914. further discussing these general plans, the following resol was adopted:

> " That there be appointed in the University of the St New York Education Department an Assistant Commiss of Agricultural Education, who shall be charged with t ordination and unification of agricultural education i state."

The foregoing resolution was unanimously adopted at a me of the combined committee held in Rochester, December 11,

It seems to your committee that state-supported educat processes should have their general policy, correlation an ordination under our Education Department, maintaining autonomy and control of details.

Agricultural education is not different in its fundamentals other education. The same principles are involved and the pedagogy used. It should, therefore, be under the same ge control, its policy administered by the same competent body its affairs developed by similar mechanism.

REPORT OF COMMITTEE ON AGRICULTURAL EDUCATION

DEAN H. E. COOK

Your committee has endorsed the report of the special mittee on agricultural unification, and asks the privileg making their report a part of the report of this committee.

Your committee also recommends to the careful consider of this society the proposition to change the unit of admin tion of the rural schools of the state from the district syste the township system. Inequalities in taxation, for education ticularly, exist under the antiquated plan of the school di system. The modern idea now prevails to a large extent, majority of the best farming sections of the country, of bri more pupils and more property to the support of a single sch that the work of such school may be graded, better teacher ployed, adequate equipment provided, and the schools of the ing sections made the equal of the city or village schools. committee believes that the township system worked out on p

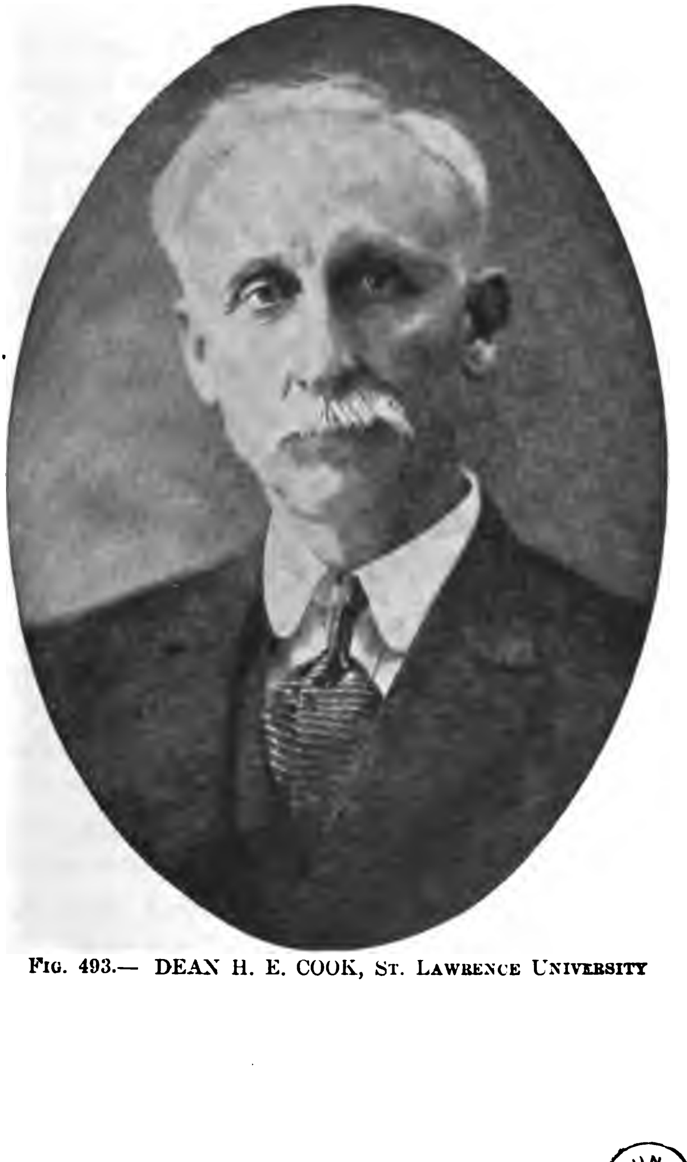

FIG. 493.— DEAN H. E. COOK, ST. LAWRENCE UNIVERSITY

UNIV OF

es would result in a economical administration of school affairs the rural regions, as well as providing not only school facilities cessary for the proper development of the educational interests the state, but an enlarged use of school plants throughout the ricultural sections for community purposes.

MR. SCHRIVER: I move a division of the subject and then move adoption of the report of the first committee on Unification of ricultural Education.

THE PRESIDENT: It is moved and seconded that we divide the ject of Dean Cook's reports and vote for the adoption of the t report which is the report on the correlation of the agricul- al educational subjects.

Carried.

MR. SCHRIVER: In order to bring it before the body parlia- ntarily, I move the adoption of the second report.

Motion lost.

DEAN COOK: Would I be out of place in asking for a more itive vote on the township system? If I ever saw a weak vote both sides, it was expressed by this audience. If the subject worth our attention at all it is worth putting some positive np on it. Let us show where we stand on a question that is nd to be important in the next few years in our rural nmunities.

MR. FRASER: I honestly do not know how to vote on it. I judge have a committee that has been working hard and that are inter- ed, but personally I do not know how to vote on it.

THE PRESIDENT: I think Mr. Fraser expresses a somewhat gen- l feeling or condition. The chair will consider any resolution.

DEAN COOK: I should like to move for a reconsideration and e us a chance to vote on the two questions involved.

THE PRESIDENT: The Chair believes that a brief statement of t what the township proposition is, would probably clarify the tter a little in the minds of some people who have not given it ch study. My understanding is that the proposition is to create the township a township board to take the place of the district ool boards as we have them now, leaving the disposition of the schools entirely in local hands. This would make it possible the town board to combine two or more schools in one if that se advisable, and at the same time it would be left to the discre of the board to continue other districts where they are now or ized. The board would have the privilege of leaving the ma just as it is now, the only difference being that there would township board instead of a school district board, and that board would have the authority to combine certain schools, if seemed the best plan.

MR. GILES: Unfortunately, I was out of the room and came in just at the close of this report. It seems to me that are not going at this just right, and, since it is open for re sideration, I believe what I shall say will be in order. This mittee has done a large amount of work at your direction. I t it is entirely right and proper to accept the report of that mittee without adopting any part, and then take up the diffe recommendations for adoption or rejection. Let us accept it, then it becomes our property and we can discuss it and settle a parliamentary manner.

THE PRESIDENT: Shall we reconsider the question?

Motion seconded. Carried.

THE PRESIDENT: The Chair will now consider a resolution the question as it originally stood.

MR. GILES: I move that the report of this committee be cepted. By that I mean it then becomes our property and we take the questions up separately, and the body take care of the

Motion carried.

THE PRESIDENT: Is there anything further at this time? might say that I think the usual way would be for the matte come in as a resolution and go to the Committee on Resoluti If the Chair might, it would suggest that this be done in case.

MR. VAN ALSTYNE: It seems to me that the matter is cle before us, and that we should dispose of it now. I move that society accept or adopt the proposition of the township schoo outlined by Dr. Finegan yesterday.

Seconded.

THE PRESIDENT: I think that the resolution should be put in writing and submitted to the Committee on Resolutions.

MR. SCHRIVER: Is there any objection to our continuing in the way we once started, proceeding with the adoption of the first report?

THE PRESIDENT: It has been adopted.

MR. SCHRIVER: What did the reconsideration involve?

THE PRESIDENT: The second question.

MR. SCHRIVER: I move that we adopt the report as presented by the chairman of the committee.

MR. GILES: I appear to discuss this question under some embarrassment, as I am not quite ready to be recorded. I am a little like Mr. Fraser. We certainly had a very illuminating discussion yesterday by Dr. Finegan, and one that probably carried conviction to some doubters. In round terms Dean Cook has said, and Dr. Finegan approved, that we stand for the township system. But there are many details that have to be worked out before we can act intelligently. We have relegated to ourselves in a way, for the time being, duties of assistant legislature, and we would not want them to pass a bill without a first, second and third reading. We understand a bill is to be introduced. We do not know how these schools are to be supported. We do not know how the present indebtedness will be handled. I do not want to see a reform movement stopped. I am very confident in the opinion that neither this state society, nor any of us as individuals, are sufficiently posted on the whole details of this plan to pass now an arbitrary resolution to send to the legislature, stating that we will adopt the township system. It may be coming. If it is coming, let us go carefully. I am opposed to this society passing this sweeping resolution now that ties us to a system, the details of which we do not know. I shall vote, no.

MR. VAN ALSTYNE: I have always been an opponent of the township system of schools, but as I said in conversation with Dr. Finegan yesterday, I have become converted. There are some details I do not know about and that I am not clear on, but it seems to me that this body is not called upon at this time to pass upon details — that is not our function in regard to any matter.

As I understand it, we are only called upon now to pass upon a approve the principle of the township system and the system of town board of trustees, which to my mind is certainly sound. C district superintendents are very good, but it must be appar from what Dr. Finegan said, that an immense amount of po is in their hands; not too much power if they are the right m but a great deal too much if they fail to come up to that standa With the system of the township trustees, it seems to me that avoided. I believe we must have something better. Here i plan presented, apparently economic, that has been worked in other places, and we are simply asked now to vote on approval of the township system as a whole. I believe the pr ciple is sound and I think that the majority of people so belie The details can be worked out later.

MR. WEED: I believe Mr. van Alstyne has brought out proper point. We are not concerned with the details. The port of the committee simply says that they approve the townsl system as an abstract thing. We are not called upon to appr any special township system, but that we believe the townsl system is better than the supervisory district system. I am fu convinced that it would be better in the district where I live. have, I think, 9 pupils on our school roll at present. There w 18 last year and I think our average attendance was about 7. cannot afford to pay the teacher we would like to have to te those pupils. If the whole enrollment comes, there are but pupils, ranging from 6 to 16 years of age. It is a pretty h thing to get one teacher competent to teach them. It is no specific plan but the general plan which we are called upon approve.

MR. TUTTLE: I think there is a misapprehension here on part of some, that if we adopt the township system we are go to do away with the school superintendent system. This is true. Dr. Finegan said that the school superintendent could sup vise the fewer schools after consolidation much more efficien than he could supervise the large number of schools under present district system. It does not do away with the super tendent at all. It means the consolidation of certain scho making perhaps one instead of four. Misapprehension should be in our minds when we vote on this question. I think that this question is one that ought to be referred to the Association of School Superintendents. They are the men who visit all of these district schools. They know their own territory absolutely and perfectly, they know the requirements of the schools and the communities, and the feeling of the people in those communities. I wish to amend the motion which is before us by making a motion to amend this way, "That this question be respectfully referred to the Association of School Superintendents of this State," and let them confer with the Education Department on this subject.

DEAN COOK: It seems very unfortunate — we are dealing with legislative problems and education problems, soil problems, and all the problems incident to our life, and I do not understand that this is a school of agriculture, a legislature, or an education department. If our good friend's position were sound we can eliminate all of our work and refer it back to the organizations that deal with these subjects.

THE PRESIDENT: If Dean Cook would allow the Chair to say, the amendment has not yet been seconded.

All in favor of the adoption of the report on the township system, signify it by rising.

Carried — 30 to 13.

THE PRESIDENT: Gentlemen, in the year 1899, the organization of the New York State Department of Agriculture took away the functions of the New York State Agricultural Society, and the society was in a dormant condition for from ten to eleven years. At that time we woke up one morning and we were told, or read in the papers, that a boy from Cornell had been appointed Commissioner of Agriculture. Things went on in a normal way and only a few weeks had passed when some of us discovered that instead of a boy we had a full grown man. Just when he became a man some of us do not seem to know. I think most of us concluded before we went very far that he had been born a man.

After the society had remained dormant for about ten years, this young man saw a future in it and possibility for it, so he reorganized it. More than any other one man in this state he is responsible for your being here now, and for the things this society has done in the last five years. I am in a position know something of the sentiment of the farmers of the state New York, and I say without hesitation that I believe there is man who is away down in the affections of the people — of farmers of this state — more than Raymond A. Pearson.

We later had another awakening — a sad awakening. learned that the state of Iowa had recognized the services t we were receiving and they bid for our man, and for a time t have him. I do not believe they are going to keep him indefint

Mr. Pearson has come out of the prairies back to his old h to talk to us on a question with which he is entirely familiar which is important to the people of the state of New York. asked him to come and discuss this subject; I know that came with a great deal of personal sacrifice. Commissioner Pe son,—as we are glad to call him—the house is yours for the prese

HOW TO CLARIFY THE MILK SITUATION

DR. RAYMOND A. PEARSON

Mr. President, Ladies and Gentlemen: I appreciate the v kind remarks of your president although I know they are deserved. It is a great pleasure for me to be in attendance at t meeting; it takes me back to old times. I am glad to see here many who have been working in the ranks all through the ye helping this organization to do the great work it has been doi and I am glad to see how your ranks have been increased. I o wish that all of the members of this organization, and many oth throughout the state like you, could appreciate the splendid w which the State Agricultural Society has done during the seventy-five years. I wish that could be appreciated and the wish that all could realize that the work of this organization is o just begun. I do not believe that the opportunity in either of th legislative chambers over yonder is greater than the opportun within this New York State Agricultural Society.

I am glad that so many are here to attend this meeting. I tr that future meetings will be attended by thousands instead hundreds, and I hope that through these meetings the agri tural policies of this state will be determined.

I bring you greetings from the state of Iowa. And if there is any Massachusetts person present in this audience I want to say for his benefit that the state of Iowa is larger than Massachusetts. It is about the same size as the state of New York — has just about as many farms, and during the past year a goodly proportion of them have been prosperous. I give this information for the benefit of any one from Massachusetts, because only a few weeks ago a gentleman from that state was visiting in Iowa, and after traveling about a few days he expressed real surprise in finding that Iowa is larger than Massachusetts. I was tempted to tell him of the question an Englishman asked me in London: "Is Boston in Massachusetts or is Massachusetts in Boston?"

But I do not want to speak to you as an Iowan at this time. I should rather speak to you as a life member of this association and as a New York State dairy farmer, which I continue to be, although I find it difficult to run a farm in New York State, even a small one, at a distance of one thousand miles.

I appreciate that your program is heavily laden this afternoon, and I shall try not to exceed the time allotted. I believe it was the president of Yale who was asked one time by a preacher, how long a discourse might be. He knew that this man was noted for his long sermons and President Dwight remarked, "There is a tradition here that no souls are saved after the first twenty minutes."

I shall refer first to the work of some agricultural organizations in Europe. About five years ago this New York Association passed a resolution calling attention to the importance of having some one from this state visit the various European countries and study the work of the agricultural organizations over there. At that time little did I think that the duty would ever come to me. But, after resigning as Commissioner of Agriculture, my successor, Commissioner Huson, invited me to make such a study for the Department of Agriculture. Considerable data was collected, and since that time more data has been secured, and I am glad to be able to tell you that the matter is about to be issued as a bulletin from the Department of Agriculture. I hope it will fall into the hands of the members of this society and that you will find it to be of value to you.

Some years ago the dairymen in Switzerland were in distr
The prices of milk were below the cost of production. There
criticism because of the quality of the product they were exporti
Their surplus milk went largely into cheese and that cheese
sent into other countries, especially into this country. The gove
ment of Switzerland, realizing the importance of the dairy ind
try to the country, was willing to do anything within its power
improve conditions, but they did not know what to do. Priv
interests were willing to do anything, but they knew not what
do. Finally, the dairymen of Switzerland organized and stud
their own problems carefully. They found that the prices of
the dairy products consumed at home, which constituted the m
part of their production, were kept at an abnormally low po
because the price of the exported product was low, and this
because its quality was not so good that it could compete with s
ilar products from other countries. So these dairymen, throu
their organization, set about to remedy matters. They appoin
their own inspectors to inspect dairies and cheese factories for
purpose of improving the quality of the product. This resulted
raising the price of the cheese exported, and this in turn raised
price of all dairy products sold in Switzerland. They met w
great success when they took charge of their own problem.

Some years ago there was an avalanche of criticism direc
against the great packing companies in Chicago. It culmina
in the issue of a book in which revolting conditions said to obt
were set forth in startling fashion. The packers were aroused,
government was aroused and official inspections were order
But the packers took matters in their own hands. They set ab
cleaning up their establishments. The conditions had been ov
drawn but there was a good deal of truth in them, and they
their plants in such condition that it was impossible for
government experts to criticize them unfavorably; thus th
protected their own interests by their own action.

This morning we heard Mr. Hale tell something of the succ
of the California Fruit Growers. Some years ago these fr
growers were in distress, mild distress perhaps, yet they were
considerable trouble. They had a large amount of illy-assort
fruit which they were unable to sell at a profitable price, a

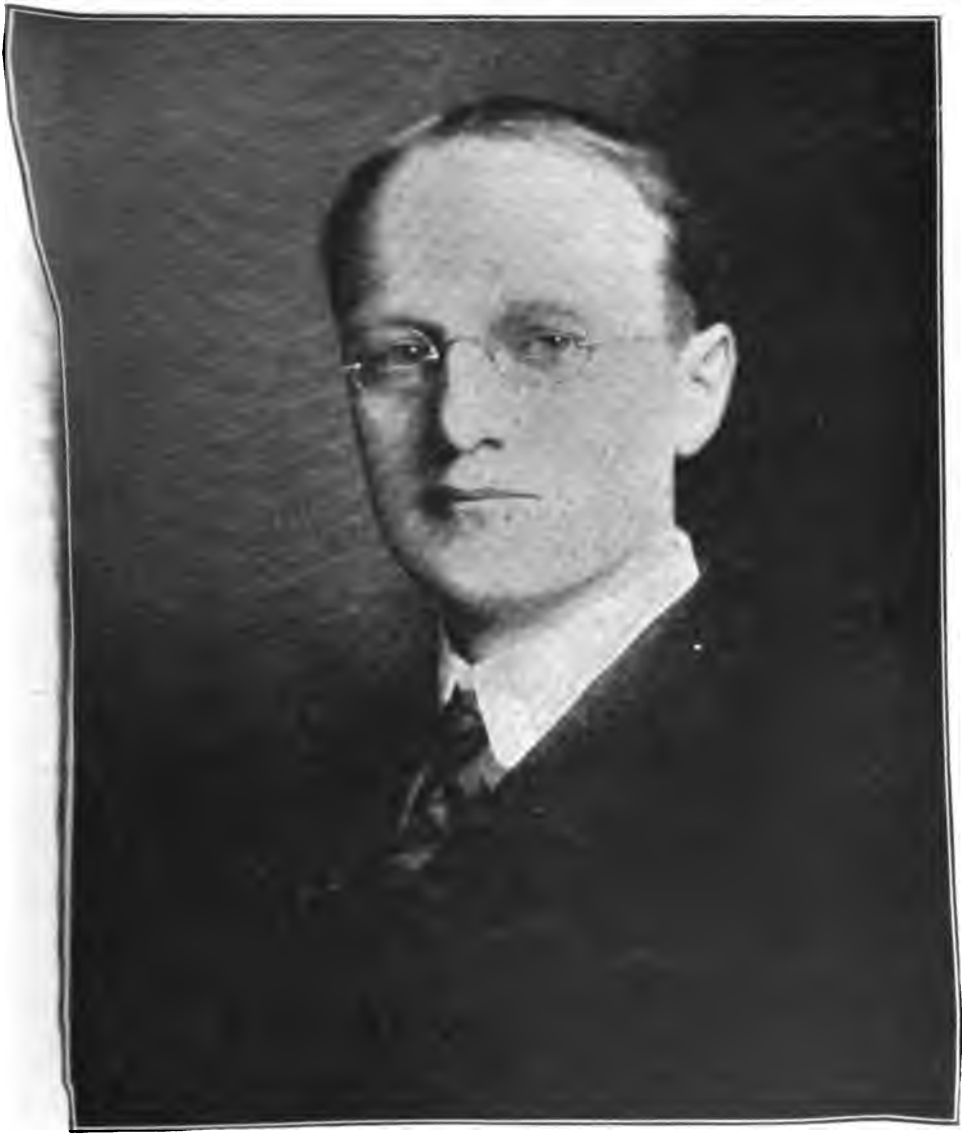

FIG. 494.— DR. RAYMOND A. PEARSON, PRESIDENT, IOWA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS

they did not know what to do. The fruit interests in California were large and important. The state was willing to do anything it could to help them, but the legislators and the officials of the state were not fruit men and did not know what to do. The fruit men organized. They studied fruit conditions in Florida, in Spain and elsewhere throughout the world, and they said to themselves, "Let us find the very best there is; let us equal it, and then excel it." Today as we think of the California fruit growers we cannot get away from the thought that they are a group of highly successful business men who are well able to run their own affairs. Mr. Hale told you they had taken from New York State — from a farm less than twenty-five miles from Albany — a young man to lead them in their great work of self-improvement. They pay him a salary of one thousand dollars a month, or better, and it pays them to do it.

Now, friends, I believe that the milk situation in New York State is more or less comparable with the unsatisfactory conditions I have noted. Just think of it! Milk is the most important of all of our food products, yet what do we hear about it? We hear the consumers complain. They say that to a certain extent the milk is stale, it is dirty, it contains excessive numbers of bacteria, it carries disease and it is too costly. We may dismiss part of these complaints because we know that they are not well founded. But we know also that there is something in some of these complaints, and it may be well for us to give attention to them. What complaints do the producers make about the milk situation in New York State? The producers complain that the milk business is being carried on without a satisfactory profit to them. They point out how cattle feeds have doubled and trebled in value; how labor has gone up; how the responsibility of labor seems to have gone down; how difficult it is to maintain a healthy herd, and how costly it is when disease, especially tuberculosis, gets into a herd. There are many dairymen in New York State who have sows that are bringing them better profits than cows, animal for animal.

There are others who come in contact with the milk business — the railroads. You do not hear much from them. They just haul the milk and collect ¾ cent a quart. Some people think they are making more out of the milk business than anybody else.

Then there are the dealers, many of whom will make out a story of their condition and their efforts to make both ends me but on the whole they seem to be able to look out for themsel reasonably well.

The law is helping the milk situation to a certain extent, we easily may make the mistake of depending too much upon law. Our milk law sets a standard. A great many people thi the legal standard represents a quality that is good enough, that is not the case. It represents the minimum quality that tolerable, and that is not good enough for the average citizen of t great state.

The fact is that milk consumption is not as large as it ou to be. There is an enormous amount of milk of first-class qual going onto our markets regularly; there is another enorm amount of milk of good quality started toward the markets a contaminated en route to its destination; and some milk is not g when it starts, and it is poorer when it gets to consumers. T facts are, further, that those who are producing milk are getting the profits from their work that they should get as co pared with the recompense for labor and intelligence which go i other lines of effort.

By far the largest interests to be considered are the intere of producers and consumers. What is to be done? It is too la a matter to be trifled with or to be experimented with careless There are too many persons engaged in the production of mi There is too much capital invested. There are too many peo depending upon the product to allow this great industry to treated recklessly. *Mr. President, I believe that this is a dai mens' problem preeminently, and the dairymen of this state and should, in their own interest, take such advanced ground reference to the milk business that all others must follow the dai men, and I believe that the problem will never be settled unti is settled by the dairymen.* Efforts may be made by others bu think the problem will always come back to trouble us again u the dairymen in this state do, with reference to the milk busin what the fruit growers of California did in reference to the fr business, and what the dairymen of Switzerland did in refere to their business. I say to the dairymen, let us throw away doubts. What is being done for better milk is in line with the world's progress along sanitary lines. Let us as dairymen help direct to progress and lead in it.

Let us not require further proof of the fact that there is now a tremendous sanitary movement going over the country; it is continuing to develop and it will continue to further develop. Let us anticipate it.

I am reminded of what the farmers in Holland did. They saw a law passed in reference to accident compensation for workmen in cities and in factories. They saw that there were certain benefits from that law but there were certain hardships. Those farmers were able to see that the next time the law-makers came together there probably would be passed such a law to protect workmen on farms. They did not want this kind of supervision, so they anticipated what was coming through their own organization. They put into operation a plan which would provide for compensation of farm laborers. They are carrying this out with entire satisfaction to all concerned, and they have the control of it in their own hands and are not harassed by legal regulations which are apt to be unreasonable.

I believe that the leading dairymen who are interested should come together and formulate standards for milk of different grades. Let us get away from the idea that milk is all of one grade. As well may we say that cloth is all of one value, and how absurd that would be. I believe that the dairymen themselves should formulate descriptions of the different grades of milk. A beginning has been made — the National Milk Committee has submitted certain grades; the New York City Board of Health also has done so; and now I understand recently the New York State Department of Health has promulgated different grades of milk. The definitions proposed by any one of them may be good. If so, the dairymen should adopt them and advocate them. If not, the dairymen should alter them. Some one says, "The dairymen cannot afford to do this." I say, they cannot afford not to do it.

Whenever the grades have been established to the satisfaction of the dairymen, they then should ask to have them protected by law and insist that the law shall be enforced. A law of that kind is a distinct benefit to dairymen who are doing honest work. The best food manufacturers are the men who are the most intere in the enforcement of the pure food law. So, reliable dairy are benefitted by the proper enforcement of good dairy laws.

The dairymen also should advise the law-makers as to all l and regulations that affect the dairy industry. In Russia, Swe Austria, Germany, Ireland and other countries, it is the custom the government to seek the advice of agricultural organizat upon matters relating to agriculture and proposed legislation, the men whose advice they seek are men selected by their fell farmers for this important advisory work. New York State da men might well be consulted in reference to various laws — esp ally the one relating to bovine tuberculosis. Ever since I first anything to do with that law I have thought it could be modi in some respects to better serve its own purpose and be of m benefit, both to the state and to the dairymen — especially th dairymen who are making an effort to free their herds from disease. This morning there was a discussion about bovine tube losis and I thought if every dairyman in New York State o would take the trouble to study the little bulletin issued by New York State Experiment Station at Geneva upon how to bovine tuberculosis out of a herd, the problem would be won fully simplified. It would be worth millions of dollars to state of New York. They had tuberculosis in that herd just bad as it is now in many other herds and they got rid of it, without any radical or severe action or any heavy losses. To they have a herd that is perfectly healthy. I do not know w any dairyman in the state of New York could not do the sa thing. I found many in Denmark doing it, men who are less telligent than our dairymen.

I believe also that the dairymen should adopt labels or bra for milk and take steps to see that they are protected by law, that milk buyers may know not only the grade but the organizat responsible for the grade of milk that has been purchased.

Some of us remember how fifteen or twenty years ago in t state some farmers were ashamed to go to Farmers' Institute m ings because they thought it exposed their ignorance. Now t feel ashamed to stay away. Can you point to any business re senting one-half, one-quarter or even one-tenth of the investm in dairying, that is without expert service? I do not believe you can do it. The dairymen should recognize that modern dairy methods, dairy work in the light and with the aid of modern science, are highly complicated, and outside expert help is needed. The fruit growers are using expert assistance in California. We are told now that the fruit growers do not even allow the fruit to be picked by ordinary labor. To produce milk successfully requires a combination of knowledge regarding veterinary medicine, breeding, judging cattle, feeding, sanitation, building, ventilation, water supply, human disease, labor, mechanics, soil, cultivation, seeds, weeds and still more. Show me a man who knows all these thoroughly and I will show you one who will soon die of brain fever.

Let the dairyman who objects to expert help remember that living is becoming complicated. No longer does a man produce all he consumes as our grandparents almost did. Now the product of our labor goes to all parts of the world, and our needs are satisfied from as wide an area. Men in industries specialize for two reasons, the first of which is to develop speed. The other day I visited the Loudon factory in Iowa, and I found one man devoting his entire time to putting hinges on stanchions. He had become very proficient at it, having worked at this particular job for so long a time. Second, they specialize to make it possible to learn what is known on different phases of their work. If the dairyman knows thoroughly the sanitary side of his work, it is likely impossible for him to keep up as well on the feeding side. There he will need expert advice. Through their own organization dairymen should have expert advice.

Briefly, I have presented this plan: the dairymen should organize. I was pleased to hear Mr. Manning tell about the Dairymen's League this morning. It seems to me this is an organization that might expand. The dairymen should organize. They should formulate standards which are satisfactory to their best interests, and secure their enactment so as to have these standards protected. They should develop their own brands and have these protected. They should employ their own experts who would be qualified to advise them on all questions, especially those relating to profits and quality. In the interest of public welfare it would be proper, in my opinion, to help bear the expense of a movement from public funds, at least until it is thorou established.

The plan presented is somewhat ideal. It will take tim grow to it. Its great feature is that the dairymen themse should be leaders in the movement to regulate milk. They able to lead. They know the subject better than anyone else their ideals are as high as other persons' ideals. Such me of course I refer to the best dairymen — are too high class t prodded or forced by others who are too often less compe than themselves. I do not believe the problem ever will be so until such men take the leadership and then the situation be made as good as they make it — none better. The public never get the high-grade milk if they depend upon compuls As long as the idea prevails that it can, the natural stubborn of mankind — at least of Yankee and Irishman, and I know t are a lot of both in New York State — will assert itself, compulsion will have to be used at almost every point. Th of what it would mean for government officials to inspect re-inspect 1,000,000 cows, or 50,000 milk cans daily to New Y city alone!

What I have suggested, if carried out, would greatly rec the expense of official inspection. It would put the milk busi on the same basis as other kinds of reputable business, and public would get fullest value from the honesty and abilit those in the milk business.

What I have suggested is more or less for the future. I ap ciate that. I am glad to get it in the records. I think I can c back ten years from now and find methods very close to what I suggesting in operation. Even if all were favorable to it, plan could not be adopted over the state, or any considerable of it, for some months, or even years.

Therefore, I propose to submit another plan for the regula of the milk supply, which would eventually lead to the i plan, and to a certain extent should always accompany it. I s offer it now as something which I believe could be put into eration at once. It would fit into present conditions and imp upon them in so far as it is adopted.

I believe that every dairy farm that is producing milk for the market should be subject to inspection, and for this purpose it should be listed. It would be reasonable to make a charge for a license, but it should not be heavy. This money would assist in the expense of inspection. Instead of having all the milk inspection work done by men who are employed full time and who come into a community, usually as strangers, and with police powers, I would have a large part of the inspection work done by men residing in the community where they work. They should work only part of the time — especially at milking time morning and evening. They should be paid for the time they put in and they should report fully to headquarters on blanks prepared for the purpose. The chief objection that can be made to this plan is that an inspector can do his best work among strangers. He can, in so far as police duties or compulsory measures are concerned. But I would give the local inspector only the power to observe conditions and to advise dairymen—except in extreme cases where he should have power to stop the shipment or use of the milk. His position should be chiefly educational. More and more men adapted to this kind of inspection are getting into the work, but there is still much room for improvement. Inspectors of the right type can be found in almost any community, and great care should be taken that they are found. The best training would be that of the veterinarian and dairyman combined, but a man well-trained in dairying could do the work if he is able to secure veterinary help when needed. As a final protection against favoritism on the part of the local inspector, he should be visited continually by a travelling inspector who would have full police powers, and who would go with the local inspector to visit dairies needing special attention and to inspect some other dairies selected at random. Conditions at these places should tally with the reports made and on file. A local inspector knowing he may be checked up at any time in this manner would not be likely to yield to pressure to be lenient with his friends.

It has been my privilege to study this problem for many years. The suggestions I have made appeal to me the more strongly because they are so simple. Experience shows that as a rule the best plans are the simplest ones. I thank you for your attention.

Mr. Schriver: I think we ought to recognize the great v of these suggestions presented by the Commissioner, and that ought in some manner express our appreciation of his pres and his service. I move that we express our appreciation of suggestions and thank him for his earnestness.

Carried.

The President: I am requested at this time to ask for re of the Committee on Unification of Work of the Departmen Agriculture and the Department of Foods and Markets.

Dean B. T. Galloway: I have been requested by the C mittee to make this report in the absence of the chairman:

REPORT OF COMMITTEE ON UNIFICATION OF WORK OF THE DEPA MENT OF AGRICULTURE AND THE DEPARTMENT OF FOODS MARKETS

The Committee appointed to consider the matter of coordi ing and unifying the work of the Bureau of Foods and Mar with the work of the Bureau of Supervision of Cooperative A ciations, begs to report that at a meeting held today a motion adopted to the effect that cooperation and unification of the services could best be brought about by leaving the matter mutual adjustment to the Commissioner of Agriculture and Commissioner of Foods and Markets.

Moved and seconded that the report be adopted.

Carried.

The President: We will now have a very brief and a illuminating article on the subject of land title, including Torrens System, by Mr. Gilbert Ray Hawes.

TORRENS SYSTEM OF LAND TITLES

Gilbert Ray Hawes

I do not propose to take up any great amount of your valu time. I should not have intruded upon your session today had not been for the kind invitation given by your presiden speak on a subject which ought to be of vital interest to e farmer in the state of New York. The topic is one that I t we can all consider to our mutual interest and advantage —

Torrens System of Land Title Registration, which I call in my paper "the first aid to the farmer."

The Torrens System of Land Title Registration was devised by Sir Robert Richard Torrens (from whom the name is derived) in Australia about the year 1854. It has spread from that day to this, until now it is in practical operation in nearly every country of Europe, and also in Canada, and in ten of our own states in the United States, as well as in all our territorial possessions, including Hawaii, the Philippine Islands and Porto Rico. It is not necessary to quote statistics, showing how, from a small beginning, the Torrens System has grown and extended. It is enough to say that today there have been registered, in the various states of the United States alone, thousands of properties, aggregating millions of dollars in value.

As a lawyer who has had something to do with the adoption of the Torrens System of Land Title Registration Law in this state —otherwise known as Article 12 of the Real Property Law, as amended by chapter 627 of the Laws of 1910 — and as attorney or counsel for most of the property owners in and about the state of New York who have successfully registered their titles under the Torrens Law, it might be interesting, if time allowed, to go into a discussion of the various questions of law involved, and particularly to show how the constitutionality of the Torrens Law has been sustained by the highest courts, including our own Court of Appeals. It is sufficient to state that the advocates of this great remedial statute have overcome every obstacle placed in their way by the old title insurance companies, or those acting in collusion with them, so that now every property owner in New York State can secure Torrens registration of his property economically and expeditiously, without fear of question, doubt or attack in the future.

Massachusetts was the first state to adopt the Torrens Law, and there they have a separate Land Registration Court. In this state all registration actions must be brought in the New York Supreme Court, after the title has been certified by an official examiner.

I shall confine this discussion to the two main questions, which are of most interest to farm owners, namely:

First. What are the benefits to be derived by property own generally from registration under the Torrens Land Title Re tration Law?

Second. In what way can the farmers and members of savi and loan associations take advantage of this law, in conjunct with the recently organized and incorporated land bank of state of New York?

The chief benefits to be derived by Torrens registration m be summarized as follows:

1. It will make the property more valuable, more salable more readily available for credit. There can be no dispute t an absolutely indefeasible title created by the state is superior the ordinary policy of title insurance, which is loaded down w "exceptions" and "conditions."

To secure such registration it is necessary first to make an ac rate survey of the premises, then the title is searched in the or nary way, and then all the papers are placed in the hands of official examiner appointed by the court. Upon the survey, stract of title and official examiner's certificate, an application then made to the court for order authorizing the issuance and p lication of the summons in the registration action. The origi complaint and other papers are filed in the county clerk's offi Copy of the summons and notice and object of action is posted the premises for forty days and also published once a week four weeks in the county newspaper. This notice is addressed "all other persons, if any, having any right or interest in, or l upon said property, or any portion thereof." This is the fam "omnibus clause," which differentiates the Torrens action fr every other action to quiet or determine title to real property.

After the expiration of the forty days, unless contest is m by one or more of the defendants, plaintiff enters his final ju ment and decree of registration, and serves a certified copy ther on the registrar of the county, who thereupon enters the same i book especially prepared for that purpose, and issues to the pla tiff what is known as the "owner's duplicate certificate of titl whereby the owner is vested in a title in fee simple absolute, mortgages or other liens being noted among the "memorials" the second page thereof. No further search is necessary.

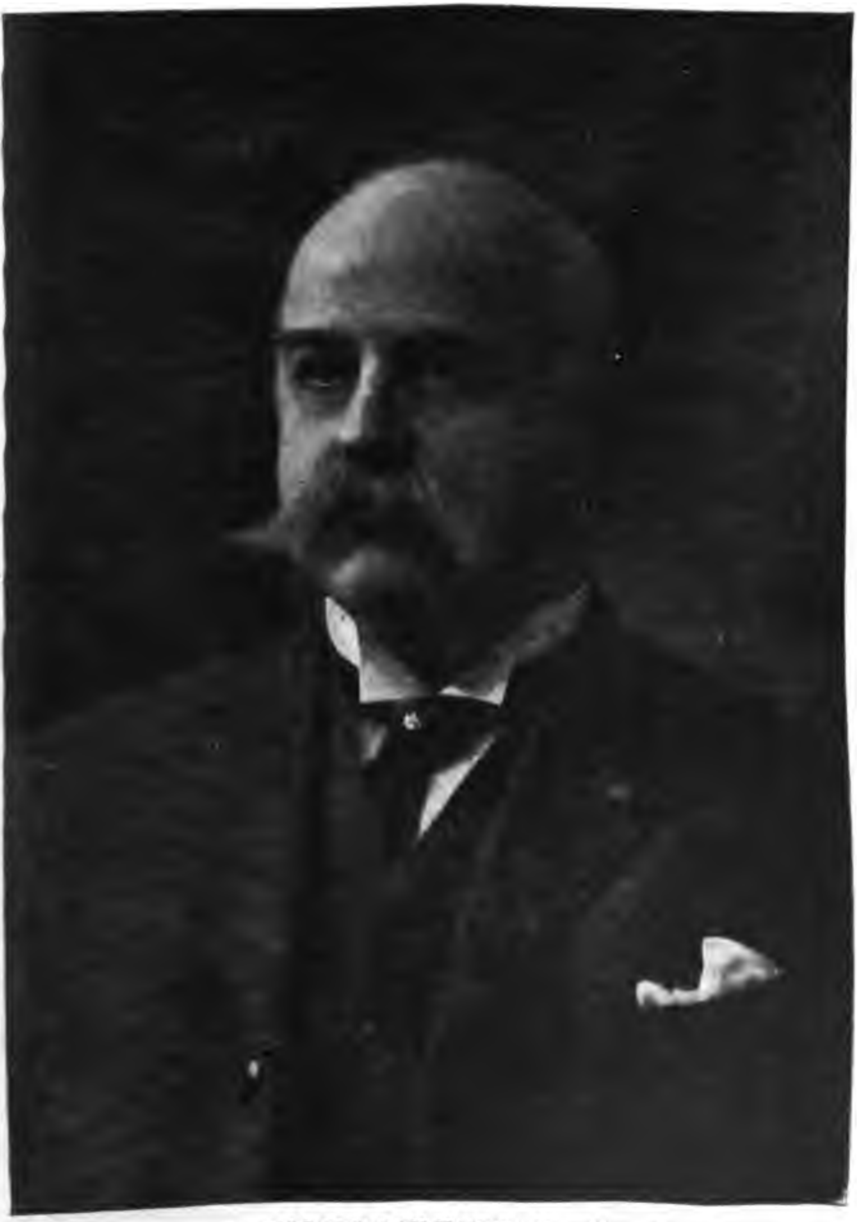

FIG. 495.—GILBERT RAY HAWES, NEW YORK CITY

subsequent transfers or mortgages are noted among the memorials, the fee for which is $2.00 in each case. In other words, it is a title "once for all."

2. As the statutory procedure, including posting, publication, application to the court, etc., requires a period of about two months, it is the part of wisdom not to wait until the necessity arises for selling or mortgaging the property, before obtaining registration of the title.

3. After the title has been once registered no new lien can be created without filing same with the registrar. This is true of a judgment subsequently entered, which cannot become a lien, unless transcript thereof is filed with the registrar against this particular property. It is a matter of a few hours only to surrender and cancel the first certificate, and to secure the issuance by the registrar of a new certificate to any purchaser of the property, and the new owner goes into immediate possession and occupancy. This is a distinct advantage to the grantee, and the grantor can obtain for his property a larger price, the difference representing a sum more than sufficient to cover the cost of his initial registration.

4. It has been found by experience that the average cost of a Torrens title, in cities, is less than one per cent. of the value of the property, which is cheaper than the schedule of rates published by the old title insurance companies, which do not pretend to vest "an indefeasible title in fee simple absolute," as under the Torrens, but merely insure the title, subject to "exceptions" and "conditions." It must be borne in mind also that no final judgment and decree in the Torrens title registration action can be entered until all clouds are removed and all defects are cured, while under the old system the clouds and defects still remain and are neither removed or cured, nor is there any guarantee as to such clouds and defects in the policy of title insurance, which merely contains "exceptions" as to such.

Coming now to the conditions which prevail among the farmers in New York State, including those who are members of savings and loan associations, certain elementary facts should clearly be borne in mind. For many years the farmer in New York State has been a victim of an antiquated and discredited banking system, which has prevented him from obtaining money loans necessary to move his crops, or otherwise, except upon the payme of usurious or exorbitant rates of interest. And even when was willing to pay a big price for such money accommodations, was difficult to find the financial institution which would lo him the money, for the reason that most of the country banks h already depleted their reserves by sending the money of the depositors to the New York City banks, which had drawn up the country banks in order to loan those moneys to the brokers Wall street, to enable them to gamble in stocks.

It was for the purpose of relieving the farmer from these u fair, unjust and onerous conditions, that the legislature enact in chapter 369 of the Laws of 1914, an amendment to the Banki Law, known as Article 10 thereof, providing for the incorporati of savings and loan associations, and also providing, in section 4 thereof, for the organization of the land bank of the state of Ne York. This system is intended to furnish ready money to loan farm mortgages for a long or short period, and at current rates interest.

I understand that more than forty savings and loan associatio with aggregate resources of more than twenty-five million dolla have already organized the land bank of the state of New Yor

Now that so much has been accomplished in this direction, t next question which naturally arises, is how the farmer may be utilize the benefits to be derived from this land bank which h been organized and incorporated especially in his behalf.

On turning to subdivision 3 of section 424 of the act, we fi that the land bank is authorized "to invest its capital and oth funds in bonds secured by first mortgages on real estate situat within the territory in which its members are authorized to ma loans; and in securities which are authorized as investments f savings banks," etc.

It will be noted that these mortgage loans are not limited properties on which policies of title insurance have been issue and consequently such mortgage loans can be made on certifica issued by the state under the Torrens Law.

Now, it is very clear that if the individual farmers, wheth members or not of the savings and loan associations, desire place themselves in a position where they can obtain witho delay and with the smallest possible expense, money accommodations to enable them to move their crops, to build new houses and barns, or to improve their properties, the wisest course for them to pursue is to proceed immediately to register the titles to their farms or other real properties under the provisions of the Torrens Land Title Registration Law. Then, with their certificates of title issued by the state, they can go to the land bank and deposit same as collateral security, and obtain whatever loans they may desire up to 60 per cent. of the value of the property, pursuant to the provisions of law which I have already quoted, and with no expense whatever other than the amount charged by the land bank for discount of their notes.

Because of the fact that an action must be brought in the supreme court in order to secure final judgment and decree of registration; and also because of the requirements of the Torrens Law with respect to posting on the premises copy of the summons and notice of object of action for forty days, and also publishing same in a county newspaper designated by the court, for four weeks, it ordinarily takes from two to three months to complete the proceedings. Then nothing further is required and the title is good against the whole world. The expense of such proceeding is not large, but, on the contrary, is quite moderate as compared with the results achieved. The cost of the first registration is usually less than that of a policy of title insurance and subsequent transfers can never exceed a cost of $2. This first expense will be materially reduced as soon as the capital stock has been fully subscribed for the "Torrens Title Insurance Company," which has been duly incorporated and which will act as corporate official examiner, under the Torrens Law, in every county of the state, thereby avoiding the necessity of employing individual official examiners, who must give bonds in the penal sum of five thousand dollars each.

As soon as the land bank of the state of New York is in full operation, each of the farmers in every county of the state can proceed to register his property under the Torrens Law and then, having obtained a certificate from the state, which is equivalent to a government bond, he can readily obtain his loans from the land bank, or from other financial institutions or individual persons, whenever the necessity for same may arise.

It cannot be disputed that the Torrens Land Title Registration Law, and the act authorizing the organization of the land bank of the state of New York, are two of the greatest remedial measures which have been enacted in recent years. They can be so utilized as to afford cooperation and mutual support, providing the farmers of the state will come to the front and declare with no uncertain sound, their hearty and unanimous support of the state land bank and the Torrens system of land title registration, which should go hand in hand to accomplish the beneficial results intended and desired.

THE PRESIDENT: Just one thought has arisen in my mind, and I want to make it plain. That is, regarding the use of the land bank. The system of registration does not affect the land bank. A mortgage may be taken under the Torrens system or under the old system. Personally, I believe that the Torrens system is very much preferable, very much more effectual and cheaper in the end than the system we have at present.

Because of the lateness in the day, and the crowding of our program due to the action of last night, I have asked the speakers on the subject of "single tax on land" to be a little briefer than we expected them to be when we invited them. Both gentlemen thoroughly understand the subject and I am sure that in a very few minutes they will be able to give us the essence of both sides.

DEBATE FOR AND AGAINST SINGLE TAX ON LAND

JAMES R. BROWN — AFFIRMATIVE

We mean by the single tax, one tax, and that levied upon the value of land exclusive of all improvements, in lieu of all other taxes. How would this affect the farmer? The opponents of the single tax go to the farmer and tell him that the single tax is a tax on land, and that he should oppose it. This is absolutely untrue. The purpose of the opponents is to get the farmer to oppose any change in our present dishonest and stupid tax system, which enables the opponents of the single tax to put into their private pockets large amounts of public value.

The single tax is the lightest tax the farmer can pay, because the average farmer has very little land value. Very little of the farm values of the state are land values; they are labor values. An ordinary farm worth $10,000 in this state has not more than $500 of land value. Deduct the labor values represented by the house, barn, outbuildings, fences, drains, orchards, crops and conditions of culture, not more than $500 would remain that could be said to be real land value.

If we were to assess 5 per cent. on the land values of this state the sum total raised from all the agricultural lands would not exceed $25,000,000, while the land values of New York City lots alone, at that rate, would raise over $250,000,000.

No wonder the land speculators want to continue a system of taxation that exempts so much land value in the great cities and loads down with taxes the labor values of the rural districts.

There is no doubt of the farmer being overtaxed. The entire value of all the farms in the state, exclusive of the results of labor thereon, does not amount to $400,000,000, while in New York City the assessed value of the ordinary lots, excluding docks and the valuable land franchises, amounts to $5,000,000,000.

Now, taxation is payment for social service. A citizen should pay for what he gets from society. It must be clear to any ordinary mortal, that the value of that service is not what a man does for himself. If a farmer builds a barn, is that a service rendered by society? If not, what moral right has the town to send an increased tax bill, having rendered no service, nor increased its expenditure on behalf of that farmer? The building of the barn was a service rendered to the farmer by himself. He gets nothing more from the county after he built the barn than he did before he built it, and any tax collected thereon is simply plain stealing by due process of law.

This characterization applies to all taxes levied upon all labor values. Now if we were to assess a tax of 5 per cent. on the land values of this state, we would have so much money we would be delirious with joy, and it would cut down immensely the amounts now unjustly collected from the farmers and the rural districts generally.

An ordinary farm of one hundred acres worth $10,000, with modern improvements, would have not more than $500 land value. If money was worth 5 per cent. in the open market, supposing the single tax was applied in its fullness, that farmer would pay $ per year in full payment for all services rendered him by socie This may seem like a small amount, and it should by right be small amount, for the services society renders the farmer are ve few. Water? The wheezy pump is his own dug well. Sewe Slops thrown out of the back door. Light? John D's ener bought by the gallon at a good price. Roads? Mainly made the farmers themselves, and they look it. Schools? Of a meag quality. As to location and convenience — several miles fr any good town. If he wants a plow point or a pound of tea, means a drive to the store with loss of time for man and tea If he goes to church to thank God for the great advantages farm life, it is probably a long drive. If he wants to attend theater, the average farmer in this state would have to go a hu dred miles, and to visit a first-class store about the same distan

The only true measure of the value of social presence a social service, is the value of the land, exclusive of improvemen that a man possesses. All social service, such as water, sewe light, police and fire protection, sidewalks and street pavi cleaning, etc., are reflected in the value of the land, but not the value of the buildings or in any of the improvements on in the land.

A man having a home in New York City, on a lot 25 x 1 feet, the land worth about $20,000, gets infinitely more fr society in the way of social advantage than a farmer way up state, whose farm consists of labor values amounting to $9,5 and land values of $500. The city man is within thirty minu of the New York Central or Pennsylvania railroad statio where he can get a train to whirl him away to any part of t continent. He is within thirty minutes of Grand Opera, or best theaters in the world, or in the same lapse of time he can aboard the ocean steamships that will convey him to any p of the world. He is also close to natural history and museums, libraries, schools, colleges and universities. The b stores in the world are within a few blocks of his house. fact he can have no desire that cannot be more easily satisfied that city than anywhere else on this continent. In a word, he ceives from society the maximum advantage from social prese

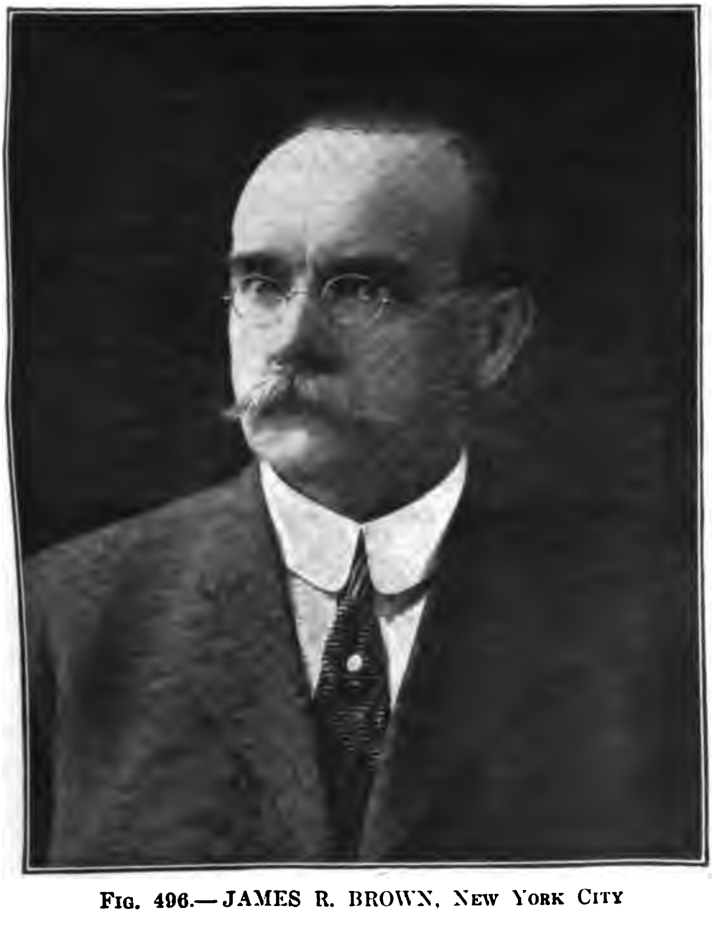

Fig. 496.—JAMES R. BROWN, New York City

and social utilities, and the sum total of all these things is registered in the enormous land values of the great city.

To understand how great the amount of the land values of New York, I have but to draw attention to the fact that the ordinary lot values of the city are assessed at over $5,000,000,000 and the assessed value of all improvements thereon is only $3,000,000,000.

The farmers of this state complain — and not without great and just reason — that they are over-taxed. Their attempts to throw off this unjust burden has been like the blind mule in the swamp — the more he struggled the deeper he sank in the mire. The reason may be laid to the farmer's lack of economic knowledge, for he did not know that to tax labor values is to increase the cost of living and to restrict production. When we tax stocks of goods we but increase the price of the goods to the people who use them. When we tax mortgages, we either raise the rate of interest, or make it harder to raise money on mortgage. When we tax money in bank, it is with the same result.

You cannot tax the wealthy person, if that is your purpose, by taxing wealth. Again we should not tax men, or attempt to do so, simply because they are wealthy. We should tax or charge men for the full value of what they get from society. A man should pay for what he gets, not for what he has. It makes no difference whether he is dealing with a storekeeper or with society.

The disastrous result of our wicked tax system cannot be overestimated. We raise the cost of living by taxing labor products, and we also raise the cost of living by failing to tax land values fully: The reason is this: we offer a greater reward and increasingly greater as time goes on, to the land speculator, paying him to withhold large areas of valuable land from the use of labor and capital, making land artificially scarce and very dear in our great centers of population, thereby raising rents and shutting the door of opportunity on labor and capital, as well as destroying the farmer's market. The high rents of our cities has a ruinous effect upon the city dweller's ability to buy farm products.

The income of the average worker in the cities is $600 a year. His rent averages $250 a year. After he meets the demands of the landlord, and that is the first call, he has little left to bu labor products of mill, factory or farm.

We will succeed in putting the tax burden where it belon and where it can most easily be borne only when we take soci value for social use.

Our present stupid and criminal tax method punishes the goo and rewards the evil. It fines those who use their opportuniti and gives a premium to those who do not. We have made more profitable to be an idler and a grafter than to be a worke

A man named Wendell recently died in New York. He w noted for one thing — he never did anything useful. He was large owner of land, but he never spent a dollar for a pound nails, a foot of lumber, brick or mortar — never rendered an service or produced a dollar's worth of wealth. Yet he die worth $80,000,000. After such a life of idleness, you as "How such remarkable results? Whence came the Aladdin lamp? What was the mystic power that secured for an idl $80,000,000?" It was our thieving tax system that gave publ made property or value to this man. Then to add to the sum its folly, the city, after giving away its true and honest revenu must commit grand larceny by taking large sums of private pro erty to replace the revenue which it should rightfully ha claimed and taken.

Our present tax system is a fraud and a humbug, advocated b knaves and believed in by fools. Our tax rolls are but a co lection of guesses flavored by favoritism and fraud. Our who method of raising public revenue is but grand and pettit larcen from beginning to end. We rob the producing citizen of h private property for public use, and rob society of its publ property by giving land value to private citizens.

If a man paints, repairs or improves a house, we fine hi If he plants a tree, builds a barn, erects a fence, clears up h farm and makes it by labor more productive, we punish hi We have made it more profitable to hold land idle than to use i For that reason in all our cities there is twice as much idle lan as there is used land. On many of our principal streets a sma percentage or our buildings are modern.

Where should we raise public revenue? Is it not clear that w should raise it from the area benefited by social utilities and not from private production? If we follow this principle it would relieve the farmers of a great burden they now carry, and make the men pay who are in reality best able to pay, because they get the most from society.

Who opposes the single tax aside from those who are ignorant of its principles and know not what they do? The opponents of the single tax consist of the easy-money fraternity, polite grafters, but grafters nevertheless — the men who want something for nothing; who hunger to gather where others have sown; men who wish to enjoy the fruits of labor without the annoyance of laboring.

The single tax would relieve labor and capital from an enormous and unjust burden. It will lower the cost of living, it will increase the earnings of labor and real capital. It will force into use land now held out of use for speculation, and thereby increase the opportunities for labor and capital. It will lower rents in our great cities and thereby improve the market for farmers' products. It will produce a normal and natural parity between the value of the opportunity to produce, and the value of the things produced.

It will but take for social use, social value. It will not take anything that any man produces and to which he has a moral title. It will not offer any reward to idleness as our present system does; but it will secure to labor and capital their full production. What is the fruit of this evil tree that we in our ignorance have planted and nourished all these years? Idle men and idle capital, low wages and low interest, the streets filled with beggars, the highways with tramps, the homes of the workers with poverty, the lives of business men with carking care. It has made our social life a horrid thing — want, suffering and crime on every hand.

Luxurious idleness produces enforced idleness. The stream of human misery flows on like the river in the midst of the sea; a resistless, never-ceasing tide, destroying everything lovable in millions of lives — more dangerous than "the arrow that flieth by day, and the pestilence that walketh by night." There are no social ills that cannot be traced to our wicked and unjust tax system.

Social value for social use; private property for private use — are the only sound principles upon which to base a system of public revenue.

ALLAN ROBINSON — NEGATIVE

I am sorry that I am not an orator, and that I have not the power of speech that my friend, Mr. Brown, has, but I shall put my side of the matter before you as plainly and as simply as I can.

Taxation is a difficult subject to talk about and a difficult subject to understand, and the single tax is one of the most difficult branches of taxation to discuss or to understand. The single tax is in reality not a tax at all. Indeed the single taxers themselves object to the phrase, but it is the only one which has received any general acception as applied to the doctrine of Henry George. Henry George did not believe in private property in land; he believed that all land should become common property, and he put forward the single tax as the fiscal means to make land common property.

For example, if a piece of land is worth $10,000 and the current rate of interest is 5 per cent., Henry George would have taken $500 a year in taxes, and the effect of taking the entire earning capacity of the land would be to make it valueless from a selling point of view; it would have no capital value, nothing that could be bought or sold. It is true that all Mr. George's followers would not take all the land value in taxation; some of them suggest that 90 or 95 per cent. be taken, and the balance left for the owner to pay him for the job of collecting the rents. Mr. George was not so generous; he wanted to confiscate the entire property in land, and he says, "We do not care who has the shell as long as we have the kernel."

The only places on this continent where the single tax or limited applications of the single tax have been tried out, have been in some of the cities in northwestern Canada, in Houston, Texas and Pueblo, Colorado. They had a boom out in northwestern Canada for several years, and the cities that had the single tax participated in this boom as well as those that did not have the single tax. It was a real live boom and extended all along the coast. and Los Angeles, California, had just as much of it, if not more than the Canadian cities. But the single taxers claimed that the exemption of buildings from taxation in some of those northwestern cities was the cause of the boom there, and they pointed to the rise in land values in Vancouver, which had increased from $10,000,000 in 1910 to $19,000,000 in 1912.

Then came the slump and the single tax cities shares in the slump just as they did in the boom preceding it, only they fared worse in the slump than did other cities not having the single tax. For example, the value on building permits fell from $19,000,000 in 1912 to $6,000,000 in 1914. There were no other cities in the West, so far as I can find, where the single tax was not in operation, that had any such slump as that of Vancouver.

If the single tax was responsible for the increase in the value of building permits of $9,000,000 in the two years immediately preceding 1913, what, we ask, was responsible for the decrease of $13,000,000 in the value of such permits in the two years immediately succeeding?

In referring to the claim of the single taxers in reference to Vancouver, Professor Bullock of Harvard has said, " If the single tax, rather than the previous period of flush times, accounts for the increase in building operations from 1909 to 1912, it must accept the responsibility for the slump of 1913 and 1914. It is a poor kind of magic that can be used only to account for prosperity and proves useless in a season of adversity."

Houston, Texas, is another place where they have tried the single tax, or a modified form of it. Single taxers called attention a couple of years ago to what Houston was doing in the way of benefiting through the operation of the single tax, but they have been rather quiet about it for the last year, and the reason may be found in the disclosures which I made in the public press as to the actual facts with regard to financial conditions immediately preceding the adoption of the single tax plan in Houston, and the conditions following the adoption of that plan. The single tax plan was adopted in 1911, and we find that bank deposits in Houston increased from $27,000,000 in 1909 to $36,000,000 in 1911, and they increased less than $2,000,000 in the two years immediately following. This is interesting because the single taxers have referred to the increase in bank deposits since 1911 in Houston as an indication of what the single tax will do for a community.

The only other place in this country or on the continent wh the single tax has been tried is in Pueblo, Colorado. A year they elected a Mr. Knapp, who is a Henry George single tax as one of the tax officials. Mr. Knapp put into effect the plan exempting buildings from taxation and putting all the tax bur on the land. After he had been in office a year Mr. Knapp m the following confession, "I expected a building boom with petus in all business lines, and a greater demand for labor. stead, much vacant property has gone to tax sale, the reven have been cut down, and the whole thing is rather dishearteni There is about the same percentage of unemployment here as e where. When I campaigned for this law I promised the peo that if it was not a proved success within eighteen months I wo advise a return to the old system. I have not yet lost hope, if things do not improve I believe I shall have to admit that I wrong."

Thus the practical experiments with the single tax have borne out the claims of the single taxers. On the contrary, t have formed very good arguments for the use of those who w opposed to the single tax. None the less single tax advocates still conducting their propaganda and are asking you gentlem to commit yourselves to an economic fallacy.

Suppose the single tax was to go into operation in this st and to apply to farm lands as well as to city property, what wo be the effect upon mortgages? I have pointed out that the p pose of the single tax is to make land common property, and t the effect of taking away its earning capacity is to destroy its capital value. This means that if you have a farm wo $10,000, and the single tax becomes operative in your locality, capital or selling value of your farm is destroyed. This will affect you, but it will affect the savings bank which owns a m gage upon your farm. The mortgage under the single tax has more value than the land itself has, and, assuming that the s ings bank has loaned you $5,000 on your $10,000 farm, the sin tax would wipe out the $5,000 mortgage value and the $5,000 your equity.

We can theorize all we want about the brotherhood of man common property in land, but the best way to make good citi is to give them the right to own land. I have a farm in Connecticut and I have occasion every year to hire some farm laborers. They work during the farming season, getting up in the morning, going to bed at night, and contributing nothing to the community life except what they do with their manual labor on the farm. But suppose one of these farm laborers has enough money to enable him to buy a plot of ground. When the title passes to him he becomes a different man. So long as he was one of the hired help it did not make much difference to him what condition the roads were in except that it took him a longer time to drive to the station, and he did not care much about the schools and the conduct of the village or town; but as soon as he became a land owner he took an entirely different view of things. He wanted to find out if the money he paid in taxes was properly spent upon the roads and in building bridges; he wanted to know if the schools were well conducted, for presumably he would have a family of children to be educated. He wanted to know that the town or village government was being properly conducted.

What made him a different man? Nothing more or less than the fact that he became a real estate owner and possessessed land which he hoped some day to hand down to his descendants. Does it not seem to you that this right of ownership of land is essential to good citizenship, and that when you deprive people of the right to own land you deprive them of the greatest incentive to good citizenship? And yet the single tax, if adopted, would have the effect of abolishing private ownership of land.

I am convinced from the study I have made of this subject that rents in cities would be higher under government ownership, or under the single tax, than they are now with private ownership. The rent of the land itself would be the same whether paid to the private individual or to the government, while the leaders who make it possible to put up a building would require not only the interest upon their money, but an amount each year in addition on account of the depreciation of the building. Under private ownership the lender takes as security a mortgage upon both land and buildings, and he reasonably expects that the increase in the land value will balance the decrease in the building value; but if he can only have as security the building itself he has no compensating factor to balance the yearly loss in building value, and this yearly loss represents an additional amount above and beyond the interest which must be exacted from tenants using the property. Lower rents will therefore not result from the adoption of the single tax or government ownership of land. Higher rents will be inevitable and so will congestion of population.

We have heard a great deal about the relief of congestion which would come from exempting buildings from taxation. This, of course, applies only to cities, but the inevitable effect of taking the tax off buildings and putting it to the land would cause higher buildings to be built than otherwise. This was the result in Vancouver, where it was admited that the heavy land tax made buildings go up into the air instead of into the outskirts of the city. By loading the tax on the land the owner must put his buildings up in the air; otherwise his taxes will be higher under the single tax than they are at the present time, so that both from the point of view of low rents and relief of congestion of population the single tax remedy is fallacious. I can see no possible excuse for the single tax or for government ownership of land. On the contrary I believe that our Republican institutions would be jeopardized if all land became common property, as my friend Mr. Brown contends that it should be. Perhaps the best answer ever made by those opposed to taxing land and exempting personal property, was made by Voltaire many years ago, and I will close what I have to say with Voltaire's story of the "Forty Crowns."

A French agricultural laborer who owned a small plot of land and by incessant labor, under conditions of extreme poverty, contrived to secure from the soil produce worth forty crowns. The tax gatherer, finding that this wretched peasant contrived to keep body and soul together on twenty crowns, assessed his land at the other twenty crowns, and took that amount from him. One day the peasant met an old acquaintance, who had been as poor as he, but had been left a fortune of 400,000 crowns a year in cash and securities. He lived in great style and drove a handsome coach and six horses. Said the peasant to his quondam friend, "Of course you pay half your income, 200,000 crowns, to the state." His friend replied, "You are joking, I am not a landed proprietor like you. The tax collector would be a fool to assess me because everything I have comes ultimately from the land, and somebody has already paid the tax on that. To make me pay would be intolerable double taxation. Good-bye, my friend, you pay your single tax, enjoy in peace your clear income of twenty crowns; serve your country well and come in now and then and have dinner with my lackey. Yes, yes, the single tax is a glorious thing.

THE PRESIDENT: We have a very brief report of the Auditing Committee:

PROF. W. A. STOCKING: The Auditing Committee appointed by the President has gone over the books and records of the Treasurer and has found the statement he presented yesterday to be correct. The Committee has therefore signed the statement which will go on file.

(Signed by) W. A. STOCKING, JR.
PHILIP MUNRO

THE PRESIDENT: We will now listen to the report of the Committee on Resolutions, by W. N. Giles, Chairman.

REPORT OF COMMITTEE ON RESOLUTIONS

W. N. GILES

WHEREAS, It is the sense of this New York State Agricultural Society, in session at its Seventy-fifth Annual Convention, that the Torrens System of Land Title Registration (embodied in Article XII of the Real Property Law, as amended by chapter 627 of the Laws of 1910) is destined to be of great benefit to all the farmers of the state of New York, whereby each of them can obtain for his real property an absolutely indefeasible title in fee simple, vested by the state, after all clouds have been removed and all defects cured, thus enabling him to obtain mortgage loans from the land bank of the state of New York or elsewhere, on the Torrens certificates issued by the state;

Resolved, That we heartily endorse the Torrens System of Land Title Registration, and recommend its immediate adoption by all members of this society as well as all other farmers of the state of New York, and that they proceed at once to register the titles to their properties thereunder.

Your committee studied this resolution carefully and listened carefuly to arguments of the gentlemen, and offer this substitute resolution:

Resolved, That a committee of three be appointed by the Chair to suggest the best means for developing the registration of land titles under the Torrens System of Registration Law, and use their best influence to encourage this system of registration.

We move the adoption of the substitute resolution.

Carried.

WHEREAS, The New York Agricultural Experiment Station has for some years seriously needed additional building facilities, which should provide an auditorium, business offices, space for the demonstration of station results, library rooms and relieve space in existing buildings now needed by several station departments, and in addition provide experimental forcing and plant houses and cold storage facilities;

Resolved, That the Governor and legislature be respectfully urged to provide the funds necessary to the erection of an administration, library and demonstration buildings, new forcing and plant houses, and a cold storage building.

This resolution has been unanimously adopted by our committee and we urge its careful consideration. I move its adoption.

Carried.

WHEREAS, Many farmers of the state, whose cattle have been killed for tuberculosis by officials of the Department of Agriculture, have been kept waiting for years for the compensation to which they are entitled by law, and some are waiting now, even in cases where the disease, if present at all, was shown by the autopsy to be so limited and encysted as to be absolutely incommunicable either to other cattle or to persons consuming their meat and milk; and

WHEREAS, The same farmers are nevertheless required to pay their taxes, even though their ability to do so — and in some cases their means of living — may have been destroyed or seriously impaired by the loss of their cattle;

Therefore be it resolved, That the New York State Agricultural Society respectfully but very earnestly memorialize the honorable legislature to appropriate, at the earliest possible opportunity in the present session, an amount sufficient to meet all approved claims of this character, the payment of which is now delayed by the lack of an appropriation, and also such amount, to be estimated by the Commissioner of Agriculture, as may reasonably be considered sufficient to meet promptly all future obligations of the state, of the character referred to, until the next legislature shall be able to act in the matter.

Resolved, That the Secretary be instructed to send a copy of these resolutions to the Governor of the state and to each member of the Finance Committee and Committee on Agriculture of the senate, and Ways and Means Committee and Committee on Agriculture of the assembly.

I move its adoption.

Carried.

WHEREAS, The New York State Agricultural Society for years has discussed and advocated better marketing methods and facilities for farm products and food stuffs, and

WHEREAS, The State Department of Foods and Markets has been created largely through the influence of this society, for the purpose of developing and establishing ways and means whereby producers may get more for their products and consumers may pay less for their food stuffs, by saving unnecessary commissions, charges and handling, and by eliminating waste and speculation, which have been and now are highly detrimental to both producers and consumers;

Therefore be it resolved, That the New York Agricultural Society in annual meeting assembled, in Albany, this twentieth day of January, 1915, records its unqualified approval of the establishment of the State Department of Foods and Markets and recommends that the state support and aid by liberal appropriations and cooperation, in every way possible, the fullest development of the highly important functions of the Foods and Markets Department.

I move its adoption.

Carried.

WHEREAS, It is necessary for the welfare of the agricultural interests of the state that transportation companies furnish satisfactory train service, shipping facilities and the improvements required by the development of agriculture, and

WHEREAS, Railroad companies are seriously prevented f
doing this when compelled to make large expenditures for n
labor than is necessary in train operation;

Therefore be it resolved, That the New York State Agricult
Society request of the legislature and Governor of New
State the enactment into law of Assembly Bill No. 214, w
amends the present so-called "full crew" law and authorizes
Public Service Commission of New York State to decide all
tions arising as to the number of men required for the safe
efficient operation of railroad trains within the state.

ASSEMBLY BILL NO. 214

"An Act to amend the public service commissions law, in relation to
ferring on the Public Service Commissions jurisdiction with respect t
number of men constituting crews on trains, and repealing section 54-a o
railroad law, relating to such crews.

Section 1. Subdivision 2 of section 49 of chapter 480 of the laws of
entitled "An act in relation to public service commissions, constituting
ter 48 of the consolidated laws," is hereby amended to read as follows:

2. Whenever the commission shall be of opinion, after a hearing, had
its own motion or upon complaint, that the regulations, practices, equip
appliances, or service of any such common carrier, railroad corporatio
street railroad corporation in respect to transportation of persons or
erty within the state are unjust, unreasonable, unsafe, improper or i
quate, *or that the number of men constituting the crew of any train, fr*
or passenger, of any railroad corporation within the state is insufficie
inadequate for the proper fulfillment of the service furnished by such
the commission shall determine the just, reasonable, safe, adequate
proper regulations, practices, equipment, appliances and service thereaft
be in force, to be observed and to be used in such transportation of pe
and property, *and the sufficient and adequate number of men to be emp*
upon any such train, and so fix and prescribe the same by order to be s
upon every common carrier, railroad corporation and street railroad cor
tion to be bound thereby;

REMAINDER OF SUBDIVISION CONTAINS NO AMENDMENT

§ 2. Section 54a of chapter 481 of the laws of 1910, entitled "An a
relation to railroads, constituting chapter 49 of the consolidated laws
added by chapter 146 of the laws of 1913, is hereby repealed.

§ 3. This act shall take effect immediately."

We move its adoption.

Carried.

It has been brought to our attention that a bill has been introduced or is about to be introduced to limit the length of trains which the railroad company may put into operation, and in anticipation of that,

Be it resolved, That we are opposed to any legislation limiting the length of freight trains or regarding any subject concerning which the Public Service Commissions has authority to act, or over which it has power to exercise its jurisdiction.

I move its adoption.

Carried.

WHEREAS, There is at present no law in New York State restricting the use for breeding purposes of scrub and unsound stallions,

Be it resolved, That this society recommend the passage of a compulsory registration law, similar to those now in force in some twenty other states, which requires the inspection and registration of all stallions offered for public service.

I move its adoption.

Carried.

Meeting adjourned.

LIFE MEMBERS

During the past year the secretary has written to all life members whose names appear on previous records for several years past, in order to make a correct list of all those now living. The following list was tabulated from answers received, those marked with the asterisk (*) having become members since 1900.

A

Abell, Flavel L., Phoenix.
Acker, Milo M., Hornell.
Akin, Elwood S., Glens Falls.
Aldridge, A. E., E. Washington St., Syracuse.
Alexander, W. A., Union Springs.
*Allen, Frederick H., Pelham Manor, New York.
*Allen, George W. H., 540 Park Ave., New York.
Allen, Gorton W., Auburn.
Allen, Irving W., East Syracuse.
*Allis, Clark, Medina.
Amos, Jacob, Syracuse.
*Anderson, John B., Geneva.
Andrews, Chas. D., Camillus.
Andrews, Frank H., 206 Emerson Ave., Syracuse.
Andrews, James M., Warner.
Andrews, T. E., Camillus.
Andrews, W. R., 1818 W. Genesee St., Syracuse.
Appleton, Francis H., 251 Marlborough St., Boston, Mass.
Armstrong, C. M., Homer.
Arnold, Wm. A., 603 Irving Ave., Syracuse.
Atherton, Edw. D., 1109 Avery Ave., Syracuse.
*Atwater, C. G., 17 Battery Place, New York.
Auer, Michael, 210 E. Castle St., Syracuse.
Averill, Chas. S., Syracuse.

B

Babcock, Hiram W., Auburn.
Backus, Rufus N., Syracuse.
Bailey, L. H., Ithaca.
Bain, Alonzo, Kennedy.
Baker, Fisher A., Yonkers.
Ball, Calvin S., 200 Delaware St., Syracuse.
Banning, Walter E., 1001 E. Fayette St., Syracuse.
Barber, James J., Syracuse.
Barclay, Robert C., 299 Broadway, New York.
Barlow, A. G., Medina.
Barnabas, Rev. Bro., Utica.
Barnes, Geo. M., 414 W. Onondaga St., Syracuse.
Barrett, James R., Cazenovia.
Barrus, E. R., 117 Peck Ave., Syracuse.
Barry, Thos. G., 2 Rector St., New York.
Barry, Wm. C., 706 Mt. Hope Ave., Rochester.
Batten, Geo., 381 Fourth Ave., New York.
*Beard, Robert H., Cortland.
Beckwith, Dwight S., Albion.
Belden, Alvin J., 621 W. Genesee St., Syracuse.
Belden, James Mead, 618 W. Genesee St., Syracuse.
Beley, Fred, 700 Wolf St., Syracuse.
Bell, David K., R. 6, Rochester.
Benedict, Thos. E., Napanoch.
Benham, E. M., R. 2, Canandaigua.
Benham, Murray, R. 2, Canandaigua.
Best, Wm., Ogdensburg.
Betts, S. T., 332 S. Salina St., Syracuse.
Bibbins, J. W., Weedsport.
Bicknell, J. Y., 314 Vermon St., Buffalo
Bigelow, Otis M., Baldwinsville.
Bill, James R., Ogdensburg.
Billington, B. H., Bastable Block, Syracuse.
Birge, James C., Ogdensburg.
Bisdell, Edward L., Baldwinsville.
Black, J. W., 136 No. Salina St., Syracuse.
Blessing, Fred S., Slingerlands.
Blodgett, F. H., 308 So. Clinton St., Syracuse.
Blunk, A. E., Nampa, Idaho.
Bogue, Nelson, R. 2, Batavia.
Bondy, Jos., 112 Waverly Ave., Syracuse.
Bonta, F. M., 514 James St., Syracuse.
Boshart, C. Fred, Lowville.
Bowditch, Edward, Albany.
Boyington, H. H., 1501 No. Salina St., Syracuse.
Bradley, Chris. C., 432 No. Franklin St., Syracuse.
Brainard, C. G., Waterville.
Brandow, Augustus S., Albany.
Brayton, W. E., 1117 W. Fayette St., Syracuse.

Breed, Eugene, Memphis.
Breese, Wellington E., Trenton, N. J
Brewster, S. Edward, Rochester.
Briggs, E. W., Medina.
Brill, G. D., Bedford Hills.
Brisbin, C. S., Schuylerville.
Brodie, Wm. A., Geneseo.
Brower, F. C., 317 E. Genesee St., Syracuse
Brown, A. E., Syracuse.
Brown, Almer J., 942 Oakland Ave., Toledo, O.
Brown, Charles J., Rochester.
Brown, J. Emery, Oneida.
Browne, Jesse, Jr., Jamaica.
Buchanan, Chas. J., 79 Chapel St., Albany.
Budd, S. Emory, Newark.
Burden, I. Townsend, 65 E. 78th St., New York.
Burkett, C. W., Box 319, New York.
Burn, M. T., Tilsonburg, Ontario, Canada.
Burrill, I. L., Weedsport.
Butler, E. K., 806 W. Genesee St., Syracuse.
Button, R. D., Canastota.

C

Cady, John E., 335 W. 28th St., New York.
Campbell, Alex., 802 Fulton St., Brooklyn.
Campbell, David, Syracuse.
Campbell, John S., Utica.
Carl, Ira, 23 E. Genesee St., Auburn.
Carter, Geo. F., 1240 No. Salina St., East Syracuse.
Carter, John S., 5553 Drexel Ave., Chicago, Ill.
Case, Henry J., Auburn.
Catchpole, E. W., North Rose.
Chadderton, Isaac, Weedsport.
Chamberlain, Olcott A., Richfield Springs.
Chandler, Harvey G., Ogdensburg.
Chandler, Webster L., Ogdensburg.
Chapman, Clark E., Freeville.
Chapman, E. H., 17 W. 42d St., New York.
*Charles, H. H., 23 E. 26th St., New York.
Charles, Richard S., Belmont.
Chase, Col. A. C., Comstock Ave., Syracuse.
Chase, A. S., Baldwinsville.
Chase, Carleton A., 201 Prospect Ave., Syracuse.
Chase, R. G., Geneva.
Cheney, Walter W., Manlius.
Clancy, J. R., 819 W. Genesee St., Syracuse.
Claris, Dr. John T., Buffalo.
Clark, B. Wheaton, Lockport.
Clark, J. Elmer, 1844 So. Salina St., Syracuse.
Coats, H. P., Saranac Lake.
Coakley, Daniel, Solvay.
Coe, R. E., Kirkville.
Cogswell, Ledyard, Albany.
Cogswell, P. J., R. 6, Rochester.
Cole, Chas. C., Jordan.
Converse, Frank A., Buffalo.
Converse, George H., Woodville.
Cook, Elisha, Poplar Ridge.
Cook, H. E., Canton.
Cook, Herbert J., South Granby.
Cook, Sidney H., Camillus.
Cooke, Roland C., 2818 State St., Milwaukee, Wis.
Cooley, A. H., Little Britain.
Coolidge, Chas., Clifton Springs.
Coonley, Irving, Cicero.
Cooper, H. A., Wolcott.
Cooper, James F., Albany.
Corbett, L. C., Department of Agriculture, Washington, D. C.
Cornell, Chas. Ezra, Ithaca.
Cornell, Charles P., 15 Clinton Block, Syracuse.
Cotton, Geo. G., Camillus.
Cox, Wm. B., Plainville.
Cramer, Olin, Baldwinsville.
Crandall, Wm. DeLos, West Edmeston.
Crandall, Wm. G., Homer.
Crawford, A. H., Liverpool.
Cronin, Mrs. Annie B., Syracuse.
Crosman, Chas. W., Rochester.
Crossman, H. D., Weedsport.
Cullinan, P. W., 333 W. Third St., Oswego.
Curry, Edmund J., 28 E. 95th St.,
Curtis, Edward F., 123 W. Onondaga St., East Syracuse.

D

Daboll, Chas. E., Memphis.
Daniels, Wm H., Ogdensburg.
Darrow, M. C., Solvay.
*Davis, Boothe C., Alfred.
*Davis, Dr. Chas. E., Albany.
Davison, G. Howard, Millbrook.
Dawley, F. E., Fayetteville.
DeGraff, Alfred, Fonda.
Denniston, Augustus, Washingtonville.
Dewey, C. D., Niagara Falls.
Dickinson, Austin R., 720 W. Genesee St., Syracuse.
Dillon, John J., 409 Pearl St., New York.
Dolbear, F. H., Fulton.
Dolbear, Martin E., Fulton.

Donnelly, P. H., Cazenovia.
Doolittle, L. F., Ouaquaga.
Dorchester, Robert E., 111 Cayuga St., Syracuse.
Downer, Ezra, Brewerton.
Downs, Arthur L., Mattituck.
Duffy, Hugh, Cortland.
Dunn, Thomas, Syracuse.
Dunning, David M., Auburn.
Dunning, Wm. D., 329 W. Water St., Syracuse.
Durant, Edw. A., Pittsfield, Mass.
Durston, J. F., 505 W. Genesee St., Syracuse.
Dusenbury, E. G., Portville.
Dutcher, J. Gerow, Pawling.
Dyer, Marshall R., Syracuse.

E

Earle, C. P., Gouverneur.
Earll, J. Horatio, Skaneateles.
Eastman, A. R., Waterville.
Ebeling, F. H., Gouverneur.
Eckenberger, Haman, 1040 Pennsylvania Ave., Elmira.
Ecker, George D., 1507 Milton Ave., Solvay.
Edwards, Ira, Holley.
Ellis, Earl E., Camillus.
Ely, L. D., Rochester.
Everson, Chas. B., Syracuse.
Everts, C., Cato.

F

Fage, Wm. C., Syracuse.
Fairchild, George W., Liverpool.
Fairchild, Herman, Liverpool.
Fairchild, Merritt B., 1500 No. Salina St., Syracuse.
Fairchild, Ransom, Liverpooi.
Farrington, Barney, 1118 E. Railroad St., Syracuse.
Farrington, Harvey, 485 No. Broadway, Yonkers.
Fay, Ernest A., Potsdam.
Fenton, H. N., Morley.
Ferris, Chas. C., Syracuse.
*Ferris, Hon. T. Harvey, Utica.
*Findlay, James A. D. S., Salisbury Mills.
Fisher, Conrad J., Minoa.
Fisher, John C., Madrid.
Fiske, Chas. H., East Syracuse.
Fitzgerald, Lawrence J., Auburn.
Flinn, G. D., Union Springs.
Forey, John H., 133 Wood ave., Syracuse.
Forrester, W. E., Hammond.
Forsyth, James, Owego.
Foster, Isaac H., Baldwinsville.
Fox, P. W., Canton.
Foxton, H. C., Syracuse, R. 4.
Frank, Nathan, 64 Green St., Ogdensburg.
Frazer, Frederick, 603 James St., Syracuse.
Frey, Wm. F., 1025 Lodi St., Syracuse.
Fugett, J. M., Waterloo.
Fullerton, H. B., Medford.
*Fullerton, Edith L., Medford.

G

Gardiner, E. V. R., Pine Island.
Gardner, A. L., Gunston, Va.
Gates, A. R., Liverpool.
Gates, Francis H., Chittenango.
Gates, John W., Chittenango.
Geballe, Isidore H., San Francisco, Cal.
Gere, Irving N., 535 Oak St., Syracuse.
Gere, Wm. A., 1407 Milton Ave., Syracuse.
Gibbs, Chas. M., 320 W. Fayette St., Syracuse.
Gibbs, Chas. M., Syracuse.
Giddings, F. N., Baldwinsville.
Gilbert, James M., 905 Walnut Ave., Syracuse.
*Gillette, E. C., Penn Yan.
Gillett, Harris, Unadilla.
*Godfrey, Frank N., Olean.
Gorham, Wm. B., Camillus.
Gould, James F., Warner.
Grace, Thos. J., 863 Emerson Ave., Syracuse.
Gray, Wm. H., Syracuse.
Green, Charles A., 25 Highland Ave., Rochester.
Green, Willis H., Belleville.
Greene, J. F., Waterford.
Gregory, George F., Dummerston, Vt.
Groat, John A., Castleton.
Groesbeck, E. A., 313 State St., Albany.
Guthrie, Edward A., Athens.

H

Haberle, Frank B., Syracuse.
Hadden, J. B., Pulteney.
*Hall, C. John, Peterboro.
Hall, F. G., Dansville.
Hall, George, Ogdensburg.
Hall, John B., Canandaigua.
Hallock, J. H., Saranac Lake.
Hanchett, Charles G., 211 W. Fayette St., Syracuse.
Hand, Henry M., Lyndonville.
Harder, Edward L., Philmont.
Hardy, D. P., Union Springs.
Hardy, Elias, Auburn.
Harmon, A. B., Weedsport.

Harmon, John S., Ashtabula, O.
Hasbrouck, Louis, Ogdensburg.
Havens, Chas. H., R. 3, Hannibal.
Haviland, Mrs. Wm. G., Johnsonville.
Hawkins, E. T., 302 Summit Ave., Syracuse.
Hawley, Mrs. Estelle F., Pittsford.
Hawley, Geo. W., Warner
*Hayden, Wm., McDonough.
Hayhoe, James H., 1861 W. Fayette St., Syracuse.
Heaton, C. E., Baldwinsville.
Hendricks, Francis, Syracuse.
Higgins, Alfred, Syracuse.
Hill, D. Munro., Elbridge.
Hilton, James, Slingerlands.
Hilton, Joseph, Slingerlands.
Hinsdale, Alfred L., Camillus.
Hiscock, Frank H., Syracuse.
Hitchcock, C. P., McGraw.
Hoag, Harvey, Barker.
Hoag, Ira W., Quaker Hill.
Hodges, Frank B., Syracuse.
Hoffman, W. H., R. 4, Syracuse.
Holbert, Geo. W., Elmira.
Holden, E. C., McGraw.
Holden, H. S., Syracuse.
Holihan, T. E., 1101 Milton Ave., Syracuse.
Hope, J. L., Madison, N. J.
Hopkins, Wm. E., Syracuse.
Horton, Loton, 177 W. 77th St., New York.
Hotaling, D. B., Jamesville.
Hotchkiss, Alfred J., Syracuse.
Howe, Edgar D., Weedsport.
Howe, Lewis B., Jordan.
Howell, Chas. W., Riverhead.
Howell, Fred B., Medina.
Howlett, Ames W., Syracuse.
*Hoyt, Frank D., Peterboro.
Hoyt, Lucius B., 233 Hamilton St., Albany.
Hubbell, Chas. E., 1606 W. Genesee St., Syracuse.
Hull, Benjamin F., 620 Park Ave., Syracuse.
Humbert, Chas. E., 114 No. Salina St., Syracuse.
Humphrey, James R., Heuvelton.
Hun, Marcus T., 31 Elk St., Albany.
Hutchins, Lewis H., Fulton.
Hyde, Salem, 711 W. Genesee St., Syracuse.

I

Ingalsbe, Grenville M., Hudson Falls.
Ingalsbe, James L., Glens Falls.
Ives, F. O., Schaghticoke.
Ives, Martin V. B., Potsdam.

J

James, Roscoe C., Eagle Bri
Jaques, H. M., Lockport.
Jaques, Orman S., Lockport.
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STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

CHARLES S. WILSON, Commissioner

Bulletin 72

AGRICULTURAL LAW

1915

Containing extracts from the County Law, Town Law, Labor Law, and
General Business Law, and other enactments of the Legislature
which bear some relation to agriculture.

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AGRICULTURAL LAW

Laws 1909, Chapter 9

AN ACT in relation to agriculture, constituting chapter one of the consolidated laws.

Became a law, February 17, 1909, with the approval of the Governor. Passed, three-fifths being present.

Article 1. Short title (§ 1).
2. General provisions (§§ 2–13).
3. Dairy products (§§ 30–54).
4. Adulterated vinegar (§§ 70–73).
5. Diseases of domestic animals (§§ 90–108).
6. Prevention of fraud in sale of paris green and other substances (§§ 140–144).
7. Sale and analysis of concentrated commercial feeding stuffs (§§ 160–165).
8. Sale, adulteration or misbranding of food and food products (§§ 200, 201).
9. Sale and analysis of commercial fertilizers (§§ 220–224).
10. Turpentine, linseed or flaxseed oil (§§ 240–243).
11. Apples; fruit-bearing trees (§§ 260–265).
12. Agricultural statistics (§§ 280, 281).
12-a. Sale of farm produce on commission (§§ 282–289).
13. State fair (§§ 290–294).
14. Miscellaneous provisions (§§ 300–320).
15. Inspection and sale of seeds (§§ 340, 341).
16. Laws repealed; when to take effect (§§ 360, 361).

ARTICLE 1

Short Title

Section 1. Short title.

§ 1. **Short title.** This chapter shall be known as the "Agricultural Law."

ARTICLE 2

General Provisions

Section 2. Commissioner of agriculture.
3. Power of commissioner, his assistants and employees.
4. Expert butter and cheese makers.
5. Annual report.
6. Certificate of chemist presumptive evidence.
7. Evidence; principal's liability for acts of agent.
8. Prosecution for penalties.
9. Disposal of fines and moneys recovered.
10. When injunction may be obtained.
11. When prosecution shall not be compelled to elect.
12. Examination of food for state institutions.
12a. Almshouse farms.
13. Regulation of manufacture and sale of commoditie

Department of agriculture. Commissioner. Appointment. Term of office. Salary and expenses. Deputies, etc.

§ 2. **Commissioner of agriculture.** There shall be a department of the state government known as the department of agriculture, which shall be charged with the execution of the laws relating to agriculture and agricultural products. The commissioner of agriculture shall be the chief of the department. The commissioner of agriculture shall be appointed by the governor, by and with the advice and consent of the senate. His term of office shall be three years. He shall be paid an annual salary of not to exceed eight thousand dollars and his necessary expenses incurred in the discharge of his official duties. He may appoint four deputy commissioners of agriculture, a director of farmers' institutes and appoint or employ such clerks, chemists, agents, counsel and other employees as he may deem necessary for the proper enforcement of such laws and the proper administration of the department, who shall receive such compensation as may be fixed by him, in cases where it is not otherwise fixed, and their necessary expenses.

Payment of salaries.

The compensation of his deputies, clerks, and other persons appointed or employed by him and such necessary expenses shall be paid on his certificate by the treasurer on the warrant of the comptroller.

State department charges.

All other charges, accounts and expenses of the department au- thorized by law shall be paid by the treasurer on the warrant the comptroller, after they have been audited and allowed by th comptroller. The trustees of public buildings shall furnish suitable rooms for the use of the department. (*As amended by chapter* 96 *of the Laws of* 1914.)

§ 3. **Power of commissioner, his deputies and employees.** The commissioner of agriculture, his deputies, clerks, experts, chemists, agents and counsel employed by him, shall have full access to all places of business, factories, farms, buildings, carriages, cars and vessels used in the manufacture, sale or transportation within the state of any dairy products or any imitation thereof, or of any article or product with respect to which any authority is conferred by this chapter on such commissioner. They may examine and open any package, can or vessel containing or believed to contain any article or product, which may be manufactured, sold or exposed for sale in violation of the provisions of this chapter, and may inspect the contents therein, and take therefrom samples for analysis. The commissioner of agriculture shall have the power by subpoena or subpoena duces tecum, issued and attested by him in his official capacity to require the attendance and testimony before him, or any of his deputy commissioners or other persons designated by him for that purpose, of any person whom he may have reason to believe has knowledge of any alleged violation of this chapter, and the production, before him or any of his deputy commissioners of agriculture of any records, books, papers and documents for the purpose of investigating any alleged violation of this chapter. Such subpoena or subpoena duces tecum may be served by any person over the age of twenty-one years. No person shall be excused from attending and testifying or producing any records, books, papers or other documents before said commissioner of agriculture or any of his deputy commissioners of agriculture or other person designated by him for that purpose upon such investigation upon the ground or for the reason that the testimony or evidence, documentary or otherwise, required of him may tend to convict him of a crime or subject him to a penalty or forfeiture, but no person shall be prosecuted or subjected to any penalty or forfeiture for or on account of any transaction, matter or thing concerning which he may so testify or produce evidence, documentary or otherwise, and no testimony so given or produced

Full access for inspection.

Opening cans and vessels.

Power to subpoena.

Service.

Excuse.

Testimony.

Use of testimony against witness.

shall be received against him upon any criminal action, investigation or proceeding. Refusal to testify. Any person who shall omit, neglect or refuse to attend and testify or to produce any records, books, papers or documents, if in his power so to do, in obedience to such subpoena or subpoena duces tecum shall be guilty of a misdemeanor. False statement. Any person who shall wilfully and knowingly make any false statement under oath before the commissioner of agriculture, a deputy commissioner of agriculture or other person designated, as provided herein, concerning a material matter, shall be guilty of perjury. The commissioner of agriculture and his deputy commissioners of agriculture and other persons designated, as provided herein, are hereby authorized and empowered to administer Oaths. oaths and affirmations in the usual appropriate forms to any person in any matter or proceedings authorized as aforesaid and in all matters pertaining or relating to this chapter and to take and administer oaths and affirmations in the usual appropriate forms, in taking any affidavit or deposition, which may be necessary or required by law or by any order, rule or regulation of the commissioner of agriculture for or in connection with the official purposes, affairs, powers, duties or proceedings of said commissioner of agriculture or his deputy commissioners of agriculture or for any official purpose lawfully authorized by said commissioner of agriculture. (*As amended by chapter* 345 *of the Laws of* 1913.)

§ 4. **Expert butter and cheese makers.** The commissioner of agriculture may appoint and employ expert butter and cheese Duties. makers, who shall, under his direction, examine and inspect butter and cheese factories and attend at agricultural fairs, societies and meetings designated by the commissioner, to impart thereat Information given. information as to the best and most improved method of making butter and cheese and improving the quality thereof. (*As amended by chapter* 112 *of the Laws of* 1910.)

Time. § 5. **Annual report.** The commissioner of agriculture shall Period covered. make an annual report to the legislature on or before January fifteenth, of his work and proceedings for the year ending Statements contained. September thirtieth, next preceding, which shall include a statement in detail of the number of assistant commissioners, chemists, experts, agents, and counsel employed under the provisions of this chapter during such year, and their compensation, expenses and disbursements; and also a statement in detail of the expenditures of moneys appropriated for the state agricultural society, the county agricultural societies and the New York agricultural experiment station; and other agricultural purposes and estimates of the amounts required for all such purposes for the ensuing year. He may require the state agricultural society and the county agricultural societies to make reports to him and prescribed* the form of such reports. **Society reports.**

§ 6. **Certificate of chemist presumptive evidence.** Every certificate, duly signed and acknowledged, of a chemist, analyst or other expert employed by the commissioner of agriculture or any analysis, examination or investigation made by such analyst, chemist or expert with respect to any matter or product which the commissioner has authority to examine or cause to be examined, shall be presumptive evidence of the facts therein stated.

People v. Eddy. 12 N. Y. Supp. 628; People v. Kibler, 106 N. Y. 321; People v. Mahaney, 41 Hun, 26; People v. Schaeffer, Id. 23; People v. Thompson, 14 N. Y. Supp. 819; People v. West, 106 N. Y. 293.

§ 7. **Evidence; principal's liability for acts of agent.** The doing of anything prohibited by this chapter shall be evidence of the violation of the provisions of this chapter relating to the thing so prohibited, and the omission to do anything directed to be done shall be evidence of a violation of the provisions of the chapter relative to the thing so directed to be done. The intent of any person doing or omitting to do any such act is immaterial in any prosecution for a violation of the provisions of this chapter. Any person who suffers, permits or allows any violation of the provisions of this chapter by his agent or servant or in any room or building occupied or controlled by him, shall be deemed a principal in such violation and liable accordingly. Any person who shall keep, store or display any article or product, the manufacture or sale of which is prohibited or regulated by this chap-

Evidence of violation.

Intent immaterial.

Display deemed as sale.

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* So in the original.

ter, with other merchandise or stock in his place of business, shall be deemed to have the same in his possession for sale.

People v. Bosch, 129 App. Div. 660; People v. Hills, 64 Id. 584; People v. Terwilliger, 59 Misc. Rep. 617.

Cause for prosecution.

Place of action.

§ 8. **Prosecution for penalties.** Whenever the commissioner of agriculture shall know or have reason to believe that any penalty has been incurred by any person for a violation of any of the provisions of this chapter, or that any sum has been forfeited by reason of any such violation, he may cause an action or proceeding to be brought in the name of the people for the recovery of the same. Such action may be brought in the county where the product is sold, offered or exposed for sale, or in the county where the adulteration or violation, or any part thereof, occurred.

People v. Belknap, 58 Hun. 241; People v. Briggs & McQuade, 114 N. Y. 56; People v. Buell, 85 App. Div. 141; People v. Cipperly, 37 Hun, 324, (dissenting opinion) 101 N. Y. 634; People v. Hodnett, 81 Hun, 137; People v. Lamb, 85 Id. 171; People v. Liberman Dairy Co., 59 Misc. Rep. 22, 195 N. Y. 609; People v. Munn, 131 App. Div. 341; People v. Salisbury, 2 Id. 39; s. c., 151 N. Y. 663.

Moneys recovered.

Disposal.

In New York City.

Disposal of residue.

§ 9. **Disposal of fines and moneys recovered.** One-half of all moneys recovered, either as penalties, forfeitures or otherwise, for the violation of any of the provisions of this chapter, and from fines imposed as a punishment for any criminal offense committed in violation of the provisions of this chapter, or of the penal law relating to the punishment of criminal offenses committed in violation of the provisions of law for the prevention of frauds in the manufacture or sale of any of the articles or products to which this chapter relates, shall be paid by the court or the clerk thereof to the city or county where the recovery shall be had or fine collected, for the benefit of the poor of such city or county, except in the city of New York, where the same shall be paid to the proper authorities, and equally divided by them between the pension funds of the police and fire departments. The residue of such moneys shall be paid into the treasury of the state, and paid out by the treasurer, upon the warrant of the comptroller, for the purpose of defraying the expenses of the department of agriculture, audited by the comptroller. The same disposal shall be made of all moneys recovered upon any bond given by any officer by virtue of the provisions of this chapter.

§ 10. **When injunction may be obtained.** In an action in the supreme court for the recovery of a penalty or forfeiture incurred for the violation of any of the provisions of this chapter an application may be made on the part of the people to the court or any justice thereof for an injunction to restrain the defendant, his agents and employees from the further violation of such provisions. The court or justice to whom such application may be made, shall grant such injunction on proof, by affidavit, that the defendant has been guilty of the violations alleged in the complaint, or of a violation of any such provision subsequent to the commencement of the action, and in the same manner as injunctions are usually granted under the rules and practice of the court. No security on the part of the plaintiff shall be required, and costs of the application may be granted or refused in the discretion of the court or justice. If the plaintiff shall recover judgment in the action for any penalty or forfeiture demanded in the complaint, the judgment shall contain a permanent injunction, restraining the defendant, his agents and employees, from any further violation of such provision of this chapter. Any injunction, order or judgment obtained under this section may be served on the defendant by posting the same upon the outer door of the defendant's usual place of business, or where such violation was or may be committed, or in the manner required by the code of civil procedure, and the rules and practice of the court. Personal service of the injunction shall not be necessary when such service can not be secured with reasonable diligence, but the service herein provided shall be deemed sufficient in any proceeding for the violation of such injunction.

Application for injunction.

Granting injunction.

Security.

Costs.

Permanent injunction.

Hopkins v. Clemson College, 221 U. S. 636; People v. Bouchard, 6 Misc. Rep. 459; People v. Schintzius, 61 Id. 410; People v. Windholz, 68 App. Div. 552.

§ 11. **When prosecution shall not be compelled to elect.** In an action for a penalty or forfeiture incurred by reason of the violation of the provisions of this chapter, when the complaint charges a violation of any two or all of such provisions, the plaintiff shall not be compelled to elect between the counts under such different provisions but shall be entitled to recover if it is found that a

Plaintiff entitled to recover.

violation of any one of such provisions has been committed fo which a penalty or forfeiture is imposed.

People v. Briggs & McQuade, 114 N. Y. 56; People v. Liberman Dairy Co 59 Misc. Rep. 22; People v. Munn, 131 App. Div. 341.

Examination of food for state institutions.

Report of examination.

Assistance to commissioner.

§ 12. The commissioner of agriculture is hereby empowered and authorized to examine or cause to be examined food or food products produced or secured for use in the state institutions — milk monthly; other foods semi-annually — and to make or cause to be made such other examinations as he may deem wise or as the facts seem to necessitate and warrant relative to such food products and relative to the agricultural methods at such institutions, and report the results of such examinations and make recommendations thereupon to the fiscal supervisor or to the superintendent of prisons or to the commission in lunacy for their respective departments or offices. For the purpose of assisting the commissioner of agriculture in the performance of duties authorized by this section, the fiscal supervisor and the superintendent of prisons and the state commission in lunacy shall secure and transmit to the commissioner of agriculture such available appropriate information and render such other assistance as the commissioner of agriculture may call for. (*As added by chapter* 434 *of the Laws of* 1910.)

Investigation of farm lands.

Instructors and lectures.

§ 12-a. **Almshouse farms.** The commissioner of agriculture is hereby empowered and authorized to make or cause to be made investigation and examination as to the farm lands at the almshouse farms of the various counties, the purposes to which they are best adapted and the crops which can most profitably be raised thereon, and to make report on the same to the boards of supervisors of the said counties; and to give lectures and demonstrations at least once each year at said almshouse upon the agricultural methods best adaptable to the various communities, sufficient notice of such lectures and demonstrations being given throughout all parts of the county. The commissioner of agriculture may assign members of the staff of the New York experiment station at Geneva, members of the faculties of the New York college of agriculture and of the various state schools agriculture, subject to the approval of the directors thereof, to carry out the provisions of this section under his direction. (*As added by chapter* 460 *of the Laws of* 1913.)

Regulation of manufacture and sale of commodities.

§ 13. Any corporation, company, association or person doing business within the state of New York in any commodity or product the manufacture or sale of which is either regulated or forbidden by the agricultural law may apply to the commissioner of agriculture to be registered in the department of agriculture. Such application shall be made annually and shall be for the current fiscal year. In making such application he shall submit the following information: his full name, postoffice address, place of business and nature of the business he is conducting, and the name or names of any special commodities he is handling, the sale of which is regulated by the provisions of the agricultural law. The commissioner of agriculture shall, upon receipt of such application, if it be accompanied with a registry fee of one dollar, register the name of such applicant, together with the information furnished as above set forth, and shall thereafter send to such applicant from time to time, as promptly as conditions will permit, a copy of decisions made by the department bearing upon the construction of the statute relating to the business conducted or commodity handled by the applicant, and copies of any rules or regulations issued by the commissioner relative thereto. All moneys received under the provisions of this act during the current month shall be transmitted by the commissioner of agriculture to the state treasurer on or before the fifth day of the succeeding month. (*As added by chapter* 313 *of the Laws of* 1911.)

Application.

Registration.

Disposal of moneys.

ARTICLE 3

Dairy Products

Section 30. Definitions.
31. Care and feed of cows, and care and keeping of the produce from such cows.
32. Prohibiting the sale of adulterated milk, imitation cream and regulating the sale of certified milk.
33. Regulations in regard to butter and cheese factories.
34. Penalty for delivery of adulterated milk.
35. Inspection; how conducted.
36. Branded cans, jars or bottles not to be sold, re-marked or used without consent of owner.
37. Regulations in regard to condensed milk.
38. Manufacture and sale of imitation butter prohibited.
39. Manufacture or mixing of animal fats with milk, cream or butter prohibited.
40. Prohibited articles not to be furnished for use.
41. Coloring matter, dairy terms, size of package, labeling, penalties.
42. Coloring matter in food products; analysis by state board of health.
43. Manufacture and sale of imitation cheese prohibited.
44. When prohibitions do not apply to skim-milk or skim-cheese.
45. Unclean receptacles and places for keeping milk; notice to violators of provisions.
46. Unsanitary cans and receptacles condemned.
47. Receptacles to be cleaned before returning; receptacles may be seized; evidence; violation; milk can inspectors.
48. Manufacturer's brand of cheese.
49. Use of false brand prohibited.
50. County trade marks.
51. Object and intent of this article.
52. Penalties.
53. Butterine and similar products not to be purchased by certain institutions.
54. Purchase, sale and use of butterine and similar products prohibited in certain institutions.

Section 55. Licensing of milk gathering stations where milk is bought.
56. Power of Commissioner to investigate.
57. Granting and revoking licenses.
58. Certiorari to review.
59. Records to be kept.
60. Right of review.
61. Offenses.
*62.
*63.
*64.

§ 30. **Definitions.** The term "butter" when used in this article means the product of the dairy, usually known by that term, which is manufactured exclusively from pure, unadulterated milk or cream or both with or without salt or coloring matter; and the term "cheese," when used in this article, means the product of the dairy usually known by that term, which is manufactured exclusively from pure, unadulterated milk or cream, or both, and with or without coloring matter, salt, rennet, sage, olives, pimentos, walnuts, peanuts, tomatoes, celery salt or onions added thereto as a flavor. And provided further, that when manufactured by adding to the elemental product of the dairy, usually known by the term "cheese," and manufactured exclusively from pure unadulterated milk or cream or both, any pimentos, olives, walnuts, peanuts, celery salt, tomatoes, or onions, that the percentage of all such substances so added shall not exceed twenty-five per centum in bulk of the manufactured product.

Butter.

Cheese.

The terms "oleomargarine," "butterine," "imitation of butter," or "imitation cheese" shall be construed to mean any article or substance in the semblance of butter or cheese not the usual product of the dairy and not made exclusively of pure or unadulterated milk or cream, or any such article or substance into which any oil, lard or fat not produced from milk or cream enters as a component part, or into which melted butter or butter in any condition or state, or any oil thereof has been introduced to take the place of cream. The term "adulterated milk" when so used means:

Oleomargarine. Butterine. Imitation butter and cheese.

Adulterated milk.

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* These sections did not become law.

Water or fluids. 1. Milk containing more than eighty-eight and one-half per centum of water or fluids.

Milk solids. 2. Milk containing less than eleven and one-half per centum of milk solids.

Fats. 3. Milk containing less than three per centum of fats.

Time taken. 4. Milk drawn from cows within fifteen days before and five days after parturition.

Feed of cows. 5. Milk drawn from animals fed on distillery waste or any substance in a state of fermentation or putrefaction or on any unhealthy food.

Insanitary surroundings. 6. Milk drawn from cows kept in a crowded or unhealthy condition; or milk produced or kept in insanitary surroundings or in any environment or under any condition whatever that is inimical to its healthfulness or wholesomeness.

Removal of cream. 7. Milk from which any part of the cream has been removed.

Dilution. 8. Milk which has been diluted with water or any other fluid, or to which has been added or into which has been introduced any foreign substance whatever.

Pure or unadulterated milk and cream. All adulterated milk shall be deemed unclean, unhealthy, impure and unwholesome. The terms "pure milk" or "unadulterated milk" when used singly or together, mean sweet milk not adulterated, and the terms "pure cream" or "unadulterated cream" when used singly or together, mean cream taken from Adulterated cream. pure and unadulterated milk. The term "adulterated cream" when used shall mean cream containing less than eighteen per centum of milk fat or cream to which any substance whatsoever has been added. (*As amended by chapter* 455 *of the Laws of* 1913.)

People v. Bosch, 129 App. Div. 660; People v. Bowen, 182 N. Y. 1; People v. Cipperly, 101 Id. 634; s. c. (dissenting opinion), 37 Hun, 324; People v. Eddy, 12 N. Y. Supp. 628; People v. Kibler, 106 N. Y. 321; People v. Koster, 50 Misc. Rep. 46; People v. Anton Koster, 121 App. Div. 852; People v. Liberman Dairy Co., 195 N. Y. 609; People v. Schaeffer, 41 Hun, 23; People v. West, 106 N. Y. 293; People v. McDermott Dairy Co., 132 N. Y. Supp. 329; Bellows v. Raynor, 207 N. Y. 389; People v. Martin, 88 Misc. 519, 151 N. Y. Supp. 69.

Care. § 31. **Care and feed of cows, and care and keeping of the produce from such cows.** No person shall keep cows, for the production of milk for market or for sale or exchange, or for manufacturing the milk or cream from the same into any article of food, in a crowded or unhealthy condition or in unhealthful or unsanitary

Feed. **Ensilage.** **Instruction.**

surroundings and no person shall keep such cows or the product therefrom in such condition or surroundings or in such places as shall cause or tend to cause the produce from such cows to be in an unclean, unhealthful or diseased condition, if the produce from such cows is to be sold, offered or exposed for sale upon the markets for consumption or to be manufactured into any food product, nor shall such cows or the produce therefrom be handled or cared for by any person suffering with or affected by an infectious or contagious disease, nor shall any such cows be fed on any substance that is in a state of putrefaction or fermentation, or upon any food that is unhealthful or that produces or may produce impure, unhealthful, diseased or unwholesome milk. But this section shall not be construed to prohibit the feeding of ensilage. The commissioner of agriculture is hereby empowered to give such instruction and impart such information as in his judgment may be deemed best to produce a full observance of the provisions of this section. (*As amended by chapter* 216 *of the Laws of* 1910.)

Impure product. **Imitation product.** **Certified milk.**

§ 32. **Prohibiting the sale of adulterated milk, imitation cream and regulating the sale of certified milk.** No person shall sell or exchange or offer or expose for sale or exchange, any unclean, impure, unhealthy, adulterated or unwholesome milk or any cream from the same, or any unclean, impure, unhealthy, adulterated, colored, or unwholesome cream, or sell or exchange, or offer or expose for sale or exchange, any substance in imitation or semblance of cream, which is not cream, nor shall he sell or exchange, or offer or expose for sale or exchange any such substance as and for cream, or sell or exchange, or offer or expose for sale or exchange any article of food made from such milk or cream or manufacture from any such milk or cream any article of food. No person shall sell or exchange, or offer or expose for sale or exchange, as and for certified milk, any milk which does not conform to the regulations prescribed by and bear the certification of a milk commission appointed by a county medical society organized under and chartered by the medical society of the state of New York and which has not been pronounced by such authority to be free from antiseptics, added preservatives, and pathogenic bacteria, or bac-

Delivery deemed an offer for sale.

Constituents stated.

teria in excessive numbers. All milk sold as certified milk shall be conspicuously marked with the name of the commission certifying it. Any person delivering milk to any butter or cheese factory, condensary, milk gathering station or railway station to be shipped to any city, town or village shall be deemed to expose or offer the same for sale whether the said milk is delivered or consigned to himself or another. Each and every can thus delivered, shipped or consigned, if it be not pure milk, must bear a label or card upon which shall be stated the constituents or ingredients of the contents of the can.

People v. Abramson and Fichhandler, 137 App. Div. 549; People v. Beaman. 102 Id. 151; People v. Briggs, 121 Id. 927, 193 N. Y. 457; People v. Cipperly, 101 Id. 634; s. c. (dissenting opinion), 37 Hun, 324; People v. Eddy, 12 N. Y. Supp. 628; People v. Kibler, 106 N. Y. 321; People v. Liberman Dairy Co., 128 App. Div. 904, 931; People v. Schaeffer, 41 Hun, 23; People v. Tsitsera, 138 App. Div. 446, 122 N. Y. Supp. 915; People v. West, 106 N. Y. 293; People v. Abramson, 208 N. Y. 138, 147 App. Div. 491, affd. People v. McDermott Dairy Co., 149 N. Y. Supp. 906.

Kind of milk prohibited.

Any part of milk kept back.

Sour milk.

Use of dairy products by factoryman.

Record of daily business.

§ 33. **Regulations in regard to butter and cheese factories.** No person shall sell, supply or bring to be manufactured to any butter or cheese factory any milk diluted with water, or any unclean, impure, unhealthy, adulterated or unwholesome milk, or milk from which any of the cream has been taken, except pure skim milk to skim-cheese factories. No person shall sell, supply or bring to be manufactured to any butter or cheese factory any milk from which there has been kept back any part of the milk commonly known as strippings, or any milk that is sour, except pure skim milk to skim-cheese factories. The owner or proprietor or the person having charge of any butter or cheese factory, not buying all the milk used by him, shall not use for his own benefit, or allow any of his employees or any other person to use for his own benefit, any milk, cream, butter or cheese or any other product thereof, brought to such factory, without the consent of the owners of such milk or the products thereof. Every butter or cheese manufacturer not buying all the milk he uses, shall keep a correct account of all the milk daily received, of the number of packages of butter and cheese made each day, and the number of packages and aggregate weight of cheese and butter disposed of each day; which account shall be open to inspection to any person who delivers milk to such factory. Whenever manufacturers of butter or cheese purchase milk upon the basis of the amount of fat contained therein and use for ascertaining the amount of such fat what is known as the Babcock test, or whenever the proceeds of co-operative creameries and cheese factories are allotted on the basis of determinations of milk fat by the Babcock test, the bottles and pipettes used in such test shall before use be examined by the director of the New York agricultural experiment station. If such bottles are found to be properly constructed and graded so as to accurately show the amount of fat contained in milk, each of them shall be legibly and indelibly marked " S. B." No bottle shall be so marked except as herein provided or used in any such test by such manufacturers, unless so examined and marked. The acid used in making such test by such manufacturers shall be examined from time to time by competent chemists employed by the commissioner of agriculture and if found not to be of sufficient strength the use of such acid shall be prohibited. No person or persons receiving or purchasing milk or cream upon the basis of the amount of fat contained therein, shall credit any patron or patrons delivering milk or cream thereto with a greater or lesser percentage or average percentage of fat than is actually contained in the milk or cream so delivered. The commissioner of agriculture or persons employed by him for that purpose may at any time assist in making tests of milk received at a butter or cheese factory for the purpose of determining the efficiency of tests usually made at such factory. All persons using other than standard bottles or acid which is not of the required strength to accurately determine the amount of fats in milk or crediting any patron or patrons delivering milk or cream with a greater or lesser percentage or average percentage of fat than is actually contained in the milk or cream so delivered, shall be subject to the penalties prescribed by section fifty-two of this article, and shall be guilty of a misdemeanor.

Babcock test glassware.

Examination of acid.

Crediting fat percentage.

Agents may assist in factory test.

Misdemeanor.

§ 34. **Penalty for delivery of adulterated milk.** Any person, firm, association or corporation delivering any milk to any butter or cheese factory in violation of any of the provisions of this chapter shall forfeit and pay to the patrons, firm, association or corporation owning the milk delivered to such factory the sum of fifty dollars, to be recovered in a civil action by the person, firm, association or corporation entitled thereto.

Stirring the milk.

Duplicate sample.

Herd sample.

Bar to action.

§ 35. **Inspection; how conducted.** When the commissioner of agriculture, an assistant commissioner, or any person or officer authorized by the commissioner, or by this chapter, to examine or inspect any product manufactured or offered for sale shall in discharge of his duties take samples of such product, he shall before taking a sample, request the person delivering the milk or who has charge of it at the time of inspection, to thoroughly stir or mix the said milk before the sample is taken. If the person so in charge refuses to stir or mix the milk as requested, then the person so requesting shall himself so stir and mix the milk before taking the sample, and the defendant shall thereafter be precluded from introducing evidence to show that the milk so taken was not a fair sample of the milk delivered, sold, offered or exposed for sale by him. The person taking the sample of milk for analysis shall take duplicate samples thereof in the presence of at least one witness, and he shall in the presence of such witness seal both of such samples, and shall tender, and, if accepted, deliver at the time of taking one sample to the manufacturer or vender of such product, or to the person having custody of the same, with a statement in writing of the cause of the taking of the sample. In taking samples of milk for analysis at a creamery, factory, platform or other place where the same is delivered by the producer for manufacture, sale or shipment, or from a milk vender who produces the milk which he sells, with a view of prosecuting the producer of such milk for delivering, selling or offering for sale adulterated milk, the said commissioner of agriculture or assistant or his agent or agents shall within ten days thereafter, with the consent of the said producer, take a sample in a like manner of the mixed milk of the herd of cows from which the milk first sampled was drawn and shall deliver the duplicate sample to the said producer and shall cause the sample taken by himself or his agent to be analyzed. If the sample of milk last taken by the commissioner of agriculture or his agent or agents shall upon analysis prove to contain no higher percentage of milk solids, or no higher percentage of fat than the sample taken at the creamery, factory, platform or other place, then no action shall lie against the said producer for violation of subdivisions one, two, three, seven and eight of section thirty of this chapter. In taking a

Fair sample.

Refusal of sample.

Copy of analysis on application.

second sample as above set forth from the mixed milk of the herd, it shall be the duty of the commissioner of agriculture to have an assistant, agent or agents present during the entire time in which the said cattle are being milked to observe closely so as to be sure that the milk thus to be sampled is not adulterated and to see that it is thoroughly mixed so that the sample taken shall be a fair sample of the average quality of the mixed milk of the entire dairy or herd of cows of said producer. If, however, the said producer refuses to allow such examination of the milk produced by his dairy, then he shall be precluded from offering any evidence whatever tending to show that the milk delivered by him at the said creamery, factory, platform or other place was just as it came from the cow. If the said producer does permit such examination, the commissioner of agriculture shall, upon receiving application therefor, send to said producer a copy of the analysis of each of the samples of milk so taken and analyzed as above provided. If a sample of milk shall have been taken by the commissioner of agriculture or by his orders or directions from any dairy within this state and an analysis thereof has been made by the commissioner or by his authority, any person who is or was buying milk from the said dairy at or subsequent to the time of such taking, may apply to the commissioner of agriculture for a copy of the analysis of the said sample of milk so taken and the commissioner shall thereafter furnish the said applicant with such copy. (*As amended by chapter* 608 *of the Laws of* 1911.)

People v. Butler, 140 App. Div. 705; People v. Hodnett, 81 N. Y. 137; People v. St. John, 89 App. Div. 617, 178 N. Y. 617, 201 U. S. Sup. Ct. 633; People v. Salisbury, 2 App. Div. 39; s. c., 151 N. Y. 663; People v. Weaver, 116 App. Div. 594; People v. Wiard, 61 App. Div. 612, 170 N. Y. 590; People v. Woodbeck, 55 App. Div. 227.

§ 36. **Branded cans, jars or bottles not to be sold, re-marked or used without consent of owner.** No person shall hereafter without the consent of the owner or shipper, use, sell, dispose of, buy or traffic in any milk can, jar or bottle, or cream can, jar or bottle, belonging to any dealer or shipper of milk or cream residing in the state of New York or elsewhere, who may ship milk or cream to any city, town or place within this state, having the name or initials of the owner, dealer or shipper, stamped, marked or fastened on such can, jar or bottle, or wilfully mar, erase or change

Tampering with label.

by re-marking or otherwise said name or initials of any such owner, dealer or shipper, so stamped, marked or fastened upon said can, jar or bottle. Nor shall any person without the consent of the owner use such can, jar or bottle, for any other purpose than for milk or cream; nor shall any person without the consent of the owner place in any such can, jar or bottle, any substance or product other than milk or cream.

Use of receptacles for other purposes.

§ 37. **Regulations in regard to condensed milk.** No condensed milk shall be made or offered or exposed for sale or exchange unless manufactured from pure, clean, healthy, fresh, unadulterated and wholesome milk from which the cream has not been removed either wholly or in part, or unless the proportion of milk solids shall be in quantity the equivalent of eleven and one-half per centum of milk solids in crude milk, and of which solids twenty-five per centum shall be fats. No person shall manufacture, sell or offer for sale or exchange in hermetically sealed cans, any condensed milk unless put up in packages upon which shall be distinctly labeled or stamped the name of the person or corporation by whom made and the brand by which or under which it is made. When condensed milk shall be sold from cans or packages not hermetically sealed, the producer shall brand or label the original cans or packages with the name of the manufacturer of the milk contained therein. (*As amended by chapter* 608 *of the Laws of* 1911.)

Milk used.

Labels on packages.

Genesee Valley Milk Products Co. v. J. H. Jones, 128 N. Y. Supp. 191 (condensed skim milk).

§ 38. **Manufacture and sale of imitation butter prohibited.** No person by himself, his agents or employees, shall produce or manufacture out of or from any animal fats or animal or vegetable oils not produced from unadulterated milk or cream from the same, the article known as oleomargarine or any article or product in imitation or semblance of natural butter produced from pure, unadulterated milk or cream of the same; or mix, compound with or add to milk, cream or butter any acids or other deleterious substance or any animal fats or animal or vegetable oils not produced from milk or cream, so as to produce any article or sub-

Manufacture of imitation butter.

Addition of foreign substance.

stance or any human food in imitation or in semblance of natural butter, nor sell, keep for sale or offer for sale any article, substance or compound, made, manufactured or produced in violation of the provisions of this section, whether such article, substance or compound shall be made or produced in this state or elsewhere. Any person manufacturing, selling, offering or exposing for sale any commodity or substance in imitation or semblance of butter, the product of the dairy, shall be deemed guilty of a violation of this chapter, whether he sells such commodity or substance as butter, oleomargarine or under any other name or designation whatsoever and irrespective of any representations he may make relative to such commodity or substance. Any dealer in any article or product, the manufacture or sale of which is prohibited by this section, who shall keep, store or display such article or product, with other merchandise or stock in his place of business, shall be deemed to have the same in his possession for sale.

Sale of imitation butter.

Violation irrespective of representations.

Display equivalent to offer for sale.

People v. Arensburg, 40 Hun, 358; s. c., reversed, 103 N. Y. 388, 105 Id. 123; People v. Bremer, 69 App. Div. 14; People v. Clark, 124 N. Y. Supp. 1023; People v. Fried, 62 Misc. Rep. 240; People v. Hale, 62 Id. 240; People v. Hill, 44 Hun, 472; People v. Kerin, 39 Id. 631, 4 Crim. Rep. 140; People v. Laning, 40 App. Div. 227, 59 N. Y. Supp. 1057; People v. Mahaney, 41 Hun, 26; People v. Marx, 99 N. Y. 377; People ex rel. McAuley v. Wahle, 124 App. Div. 762; People v. Meyer, 44 Id. 1; People v. Schintzius, 61 Misc. Rep. 410; People v. Simpson Crawford Co., 62 Id. 240; People v. Teele, 131 App. Div. 87; Plumley v. Commonwealth of Massachusetts, 155 U. S. 461, 15 Sup. Ct. Rept. 154; Powell v. Commonwealth of Pennsylvania, 114 Penn. St. 265, 127 U. S. 678; Waterbury v. Egan, 3 Misc. Rep. 355, 52 State Rep. 421, 23 N. Y. Supp. 115; Waterbury v. Newton, 50 N. J. L. 534; People v. Guiton, 210 N. Y. 1, 152 App. Div. 614, 137 N. Y. Supp. 600, revd.

§ 39. **Manufacture or mixing of animal fats with milk, cream or butter prohibited.** No person shall manufacture, mix or compound with or add to natural milk, cream or butter any animal fats or animal or vegetable oils, nor make or manufacture any oleaginous substance not produced from milk or cream, with intent to sell the same as butter or cheese made from unadulterated milk or cream or have the same in his possession with such intent; nor shall any person solicit or take orders for the same or offer the same for sale, nor shall any such article or substance or compound so made or produced, be sold as and for butter or cheese, the product of the dairy. No person shall coat, powder or color with annatto or any coloring matter whatever, butterine

Manufacture.

Sale.

Coloring.

or oleomargarine or any compound of the same or any product or manufacture made in whole or in part from animal fats or animal or vegetable oils not produced from unadulterated milk or cream by means of which such product, manufacture or compound shall resemble butter or cheese, the product of the dairy; nor shall he have the same in his possession with intent to sell the same nor shall he sell or offer to sell the same. No person by himself, his agents or employees, shall manufacture, sell, offer or expose for sale, butter that is produced by taking original packing stock or other butter or both and melting the same, so that the butter fat can be drawn off, then mixing the said butter fat with skimmed milk or milk or cream or other milk product and rechurning the said mixture, or that is produced by any similar process and is commonly known as boiled or process butter, unless he shall plainly brand or mark the package or tub or wrapper in which the same is put up in a conspicuous place with the words "renovated butter" or "process butter." If the same shall be put up, sold, offered or exposed for sale in prints or rolls, then the said prints or rolls shall be labeled plainly with printed letters in a conspicuous place on the wrapper with the words "renovated butter" or "process butter." If the same is packed in tubs or boxes or pails or other kind of a case or package the words "renovated butter" or "process butter" shall be printed on the top and side of the same in letters, at least, one inch in length, so as to be plainly seen by the purchaser. If such butter is exposed for sale, uncovered, not in a package or case, a placard containing the label so printed shall be attached to the mass of butter in such manner as to easily be seen and read by the purchaser. Every person selling, offering or exposing for sale at retail, "renovated butter" or "process butter," shall cause each parcel or package of such butter delivered to or for a customer to be wrapped in a light colored paper on which shall be printed in black letters, not less than three-eighths inch square and in Gothic type, the words "renovated butter" or "process butter." No person shall sell, offer or expose for sale, any butter or other dairy products containing a preservative, but this shall not be construed to prohibit the use of salt in butter or cheese, or spirituous liquors in club or other fancy cheese or sugar in

Process butter.

Labeling.

Labeling prints.

Labeling tubs.

Display placard.

Retail wrappers.

Preservative.

Inducing violations.

condensed milk. No person, firm, association or corporation shall induce or attempt to induce any person to violate any of the provisions of this chapter. Any person, firm, association or corporation selling, offering or advertising for sale any substance, preparation or matter for use in violation of the provisions of this chapter shall be guilty of a violation of this section.

People v. Arensberg, 40 Hun, 358; s. c., reversed, 103 N. Y. 388, 105 Id. 123; People v. Biersicker, 169 Id. 53; People v. Fried, 62 Misc. Rep. 240; People v. Hale, 62 Id. 240; People v. Hill, 44 Hun, 472; People v. Kerin, 39 Hun, 631; People v. Mack, 97 App. Div. 474; People v. Mahaney, 41 Hun, 26; People v. Simpson Crawford Co., 62 Misc. Rep. 240; People v. Waters, 114 Id. 669; Plumley v. Commonwealth of Massachusetts, 155 U. S. 461, 15 Sup. Ct. Rep. 154; Powell v. Commonwealth of Pennsylvania, 144 Penn. St. 265, 127 U. S. 678; Waterbury v. Newton, 50 N. J. L. 534.

Food for guests, employees, etc.

§ 40. **Prohibited articles not to be furnished for use.** No keeper or proprietor of any bakery, hotel, boarding-house, restaurant, saloon, lunch-counter or place of public entertainment, nor any person having charge thereof or employed thereat, nor any person furnishing board for any others than members of his own family, or for any employees where such board is furnished for a compensation or as part of the compensation of any such employee, shall keep, use or serve therein either as food for his guests, boarders, patrons, customers or employees or for cooking purposes any article or substance made in violation of the provisions of this article. Any keeper or proprietor of any hotel, boarding-house, restaurant, saloon, lunch-counter or place of public entertainment who uses or serves therein for his guests any oleaginous substance as a substitute for butter, the manufacture or sale of which is not prohibited by the agricultural law, shall print plainly and conspicuously on the bill-of-fare, if there is one, the words, "Oleomargarine Used Here" and shall post up conspicuously in different parts of each room where such meals are served, signs in places where they can be easily seen and read, which shall bear the words, "Oleomargarine Used Here" in letters at least two inches in length and so printed as to be easily read by guests or boarders. (*As amended by chapter* 357 *of the Laws of* 1909.)

Provisions relative to legal substitutes.

People v. Berwin, 77 N. Y. Supp. 859; People v. Brien, 117 Id. 246; People v. Dobbins, 113 Id. 1076; People v. Fox, 4 App Div. 38, 74 State Rep. 500, 38 N. Y. Supp. 635; People v. Gottfried, 113 Id. 1086; People v. Guiton Co., 137 N. Y. Supp. 600; People v. Wellner, 78 Misc. 334, 149 N. Y. Supp. 999.

§ 41. Coloring matter, dairy terms, size of package, labeling, penalties. No person manufacturing with intent to sell any substance or article in imitation or semblance of butter or cheese not made exclusively from unadulterated milk or cream or both, with salt or rennet or both and with or without coloring matter or sage, but into which any animal, intestinal or offal fats, or any oils or fats or oleaginous substance of any kind not produced from pure, unadulterated milk or cream, or into which melted butter, or butter in any condition or state or any modification of the same, or lard or tallow shall be introduced, shall add thereto or combine therewith any annatto or compounds of the same, or any other substance or substances whatever, for the purpose or with the effect of imparting thereto a color resembling yellow, or any shade of yellow butter or cheese, nor introduce any such coloring matter or other substance into any of the articles of which the same is composed. And no person selling any oleaginous substance not made from pure milk or cream of the same as a substitute for butter shall sell, give away or deliver with such substance any coloring matter; nor shall any person manufacturing, selling or offering for sale any such goods make or sell them under any brand, device or label bearing words indicative of cows or the product of the dairy or the names of breeds of cows or cattle, nor use terms indicative of processes in the dairy in making or preparing butter; no such substance shall hereafter be sold, offered or exposed for sale in this state except it be sold in packages containing not more than five pounds, such packages to be wrapped and sealed, the original seal of which shall be unbroken and upon which seal shall be plainly printed the name and address of the manufacturer of said oleomargarine, and the said packages shall be plainly and conspicuously labeled with the word "Oleomargarine" in Gothic or equally conspicuous letters at least three-eighths of an inch high. The word "Oleomargarine" in large prominent letters shall be stamped by indentation on each separate brick or portion of the substance itself before it is wrapped and sealed.

Imitating butter color.

Sale or gift of color.

Dairy terms prohibited.

Weight, seal and label of package.

Brick stamp.

Penalties.

Any person violating any of the provisions of sections forty or forty-one of the agricultural law shall forfeit and pay a penalty to the people of the state of New York of not less than fifty dollars nor more than one hundred dollars for the first violation and not less than two hundred dollars nor more than five hundred dollars for the second and each subsequent violation. Whoever by himself or another violates any of the provisions of sections forty or forty-one of the agricultural law shall be guilty of a misdemeanor and upon conviction shall be punished by a fine of not less than one hundred dollars nor more than five hundred dollars or by imprisonment of not less than one month nor more than one year or by both such fine and imprisonment for the first offense and by not less than six months nor more than one year for the second offense. (*As amended by chapter* 357 *of the Laws of* 1909.)

Misdemeanor.

People v. Arensburg, 40 Hun, 358; s. c., reversed, 103 N. Y. 388, 105 Id. 123; People v. Griffin, 128 N. Y. Supp. 946, 71 Misc. Rep. 566; People v. Hill, 44 Hun, 472; People v. Redding, 70 Misc. Rep. 420; People v. Guiton Co., 137 N. Y. Supp. 600; People v. Von Kampen, 210 N. Y. 381, 149 App. Div. 887, affd.

§ 42. **Coloring matter in food products; analysis by state board of health.** No person or persons shall manufacture, sell or expose for sale any poisonous coloring matter for the coloring of food products of any kind, nor shall any person or persons use any poisonous coloring matter manufactured, sold, offered or exposed for sale within this state; nor shall any person or persons sell, offer or expose for sale any food product containing such poisonous coloring matter. The state commissioner of health shall cause samples of coloring matter that are exposed for sale upon the market for use in food products to be analyzed and report the results of such analysis to the legislature at the next session.

Poisonous coloring matter.

Analysis by state board of health.

§ 43. **Manufacture and sale of imitation cheese prohibited.** No person shall manufacture, deal in, sell, offer or expose for sale or exchange any article or substance, in the semblance of or in imitation of cheese made exclusively of unadulterated milk or cream, or both, into which any animal, intestinal or offal fats or oils, or melted butter or butter in any condition or state or modification of the same, or oleaginous substances of any kind not produced from unadulterated milk or cream, shall be introduced.

§ 44. **When prohibitions do not apply to skim-milk or skim-cheese.** Except in the counties of New York and Kings, the pro-

Skim-milk.

hibitions contained in this article against the sale of adulterated milk shall not apply to skim-milk, which is clean, pure, healthy, wholesome and unadulterated, except by skimming, sold for use in the county in which it is produced or an adjoining county, if it is sold for and as skimmed milk. The prohibitions in this article against the sale of cheese made from unadulterated* milk or cream, shall not apply to pure skim-cheese made from milk which is clean, pure, healthy, wholesome and unadulterated, except by skimming.

Skim-cheese.

People v. Kibler, 106 N. Y. 321.

§ 45. **Unclean receptacles and places for *keping milk; notice to violators of provisions.** No person, firm, association or corporation, producing, buying or receiving milk for the purpose of selling the same for consumption as such, or for manufacturing the same into butter, cheese, condensed milk, or other human food, shall keep the same in utensils, cans, vessels, rooms, or buildings that are unclean or have unsanitary surroundings or drainage or in any condition whatsoever that would tend to produce or promote conditions favorable to unhealthfulness or disease. The commissioner of agriculture shall notify all persons, firms, associations or corporations, violating this section, to clean said utensils, cans, vessels, rooms or buildings, or to so improve the sanitary conditions that the law will not be violated, and if such notice is complied with in ten days' time, Sundays excepted, then no action shall lie for a violation of this section. Any person having charge of any milk gathering station where milk is received from the dairymen for the purpose of selling the same for consumption or shipping the same to market for consumption as human food before taking such charge or operating or working as such agent or person in charge shall apply to the commissioner of agriculture for a license to so work or operate or have charge, and shall at the time of making such application, file with the commissioner a statement under oath, setting forth the fact that he will not while having charge of or operating any such milk gathering establishment or while employed therein adulterate or suffer or permit the adulteration of any such milk or any product thereof during the term for which he may be licensed. After the

Sanitation.

Notice to clean receptacles, etc.

Application for license.

Statement.

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* So in the original.

applicant shall have complied with the foregoing provisions of this section, the commissioner of agriculture upon being satisfied that the applicant is a person of good moral character and a qualified and proper person to so have charge of or operate any such milk gathering station or establishment shall issue to said applicant a license, which shall qualify him to have charge of any such milk gathering station or establishment for the period of two years from the date of such license; provided, however, that where milk is to be bought from the dairymen at any such milk gathering station by the proprietor, person in charge or any agent of the proprietor of such station, such license shall be only for a period of one year, as provided in sections fifty-five to sixty-four, inclusive, of this article, and the matter required to be set forth in the application for a license under the provisions of this section shall be set forth in the application provided for in sections fifty-five to sixty-four in addition to the matters therein required. The person regularly doing the work of receiving, caring for and shipping the milk at any station or establishment, or in case more than one person is so employed then the foreman in charge of such works shall be deemed to be a person in charge of such station or establishment within the meaning and purposes of this section. Such license certificate shall be kept at such station or establishment where the license is so employed and shall be open to the inspection of the representatives of the department of agriculture and the public. Any person having charge of any milk gathering station or establishment as aforesaid shall keep a true and correct monthly record of the receipts of milk or other dairy products received at such station or establishment, and also a true and correct monthly record of all sales or shipments of milk, cream or other dairy products shipped or sold from such station or establishment, and shall also keep a true and correct monthly record of the amount of skim milk produced in such station or establishment and of the disposition of said skim milk. Such record shall be preserved at such station or establishment for at least two years after the same shall have been made and such records shall at all times be open to the inspection of the commissioner of agriculture, his assistants or agents. When cream is sold or shipped from

Issuing license.

Exception.

Person in charge.

Certificate

Records.

Label on bottle or package.

any such station or establishment so selling or shipping milk for consumption as aforesaid, each original bottle or package of one quart or less of cream so shipped or sold shall bear a label securely attached to the side of such bottle or package on which shall be conspicuously printed the word "cream" in black letters of at least one-fourth of an inch in length or else the word "cream" shall be blown in the side of such bottle in plain raised letters of at least one-half an inch in length, and the top and side of each and every other original package or can containing cream or original crate or case containing bottles of cream so shipped or sold shall bear a label securely attached on which shall be conspicuously printed the word "cream" in black letters of at least one inch in length and also a plainly written or printed statement on the label stating from whom and what station the same is shipped and the name of the consignee and point of destination and the date on which the cream therein was produced by such separation or skimming. The shipment of each and every such original package of cream so shipped and not so labeled as herein required shall constitute a separate violation.

Conclusions as to adulterating with skim milk.

When cream is so separated or skimmed from milk at any such station or establishment and the supply of milk on hand thereat at the time of the next regular daily shipment of milk therefrom, consisting of the total amount of milk in such shipment, together with that remaining on hand immediately after such shipment, is not thereby decreased or correspondingly less than the total quantity received during any period extending from some point of time before such skimming was done until the time of such shipment, together with the amount of milk on hand at the commencement of such period, and such decrease is not equal in amount to the quantity of milk that must have been used in so separating such cream in addition to the quantity otherwise there used or disposed of during such period, such fact is conclusive that skim milk or other foreign substance was added to such milk supply within such period and shall be presumptive evidence within the meaning of this section that the same was added to each can or vessel of milk in such shipment.

Presumptive evidence.

When cream or skim milk is found to have been on the premises of any such station or establishment or is sold or shipped therefrom, such

Presumptions.

cream or skim milk so found or so sold or shipped therefrom shall be presumed to have been produced by separating or skimming at such station or establishment. In any action or proceeding relative to the adulteration of milk by removing cream therefrom or adding skim milk or other foreign substance thereto, it shall be presumed that when cream has been produced by so skimming or separating or butter has been manufactured, there was made at least five quarts of milk in the production of each quart of cream so produced and there was necessarily so produced thereby at least four quarts of skim milk to each quart of cream so produced, and that there was used at least nine quarts of milk in the production of each pound of butter so manufactured. If any such person so duly licensed shall thereafter refuse or neglect to keep and preserve full and complete records as herein required or shall refuse to exhibit such records to the commissioner of agriculture, his assistants or agents or shall violate any of the provisions of this section or any of the provisions of this chapter relative to milk or the products thereof he shall forfeit his license and shall be disqualified for a period of five years from being again licensed by the commissioner of agriculture. (*As amended by chapter* 408 *of the Laws of* 1913.)

Forfeiture of license.

§ 46. **Unsanitary cans and receptacles condemned.** All cans, or receptacles used in the sale of milk, cream or curd for consumption, or in transporting or shipping the same to market or the delivery thereof to purchasers for consumption as human food, when found by the commissioner of agriculture or his assistants or agents to be in unfit condition to be so used by reason of being worn out, badly rusted, or with rusted inside surface, or unclean or unsanitary or in such condition that they can not be rendered clean and sanitary by washing, and will tend to produce or promote in milk, cream or curd when contained therein, bad flavors, unclean or unwholesome conditions favorable to unhealthfulness or disease, shall be condemned by the commissioner of agriculture or his assistants or agents. Every such can or receptacle when so condemned shall be marked by a stamp, impression or device, designed by the commissioner of agriculture, showing that it has been so condemned, and when so condemned shall not thereafter

Rusted or unclean cans.

Marking condemned cans.

Further use of condemned cans.

be used by any person for the purpose of so selling, transporting or shipping milk, cream or curd.

§ 47. **Receptacles to be cleansed before returning; receptacles may be seized; evidence; violation; milk can inspectors.** Whenever any can or receptacle is used for transporting or conveying milk, cream or curd to market for the purpose of selling or furnishing the same for consumption as human food, which can or receptacle, when emptied, is returned or intended to be returned to the person so selling, furnishing or shipping such substance to be again thus used, or which is liable to continued use in so transporting, conveying, selling or shipping such substance as aforesaid, the consumer, dealer or consignee using, selling or receiving the milk, cream or curd from such can or receptacle, shall, before so returning such can or receptacle remove all substances foreign to milk therefrom, by rinsing with water or otherwise. When any such milk, cream or curd is sold within any city of this state or shipped into any such city, the fact of such shipment or sale shall be prima facie evidence that the same was so shipped or sold for consumption as human food. When any such can or receptacle is returned or delivered or shipped to any person or creamery so selling such substance within, or shipping the same into such city, it is deemed that such can or receptacle is liable to such continued use in so selling or shipping such substance therein for consumption as human food within the meaning and purposes of this section and section forty-six. No person shall place or suffer to be placed in any such can or receptacle any sweepings, refuse, dirt, litter, garbage, filth or any other animal or vegetable substance, nor shall any such consignee or other person through himself, his agent or employee, bring or deliver to any person or railroad or other conveyance any such can or receptacle for the purpose of such return, or any milk, cream or curd can or receptacle for the purpose of delivery or shipment to any person or creamery engaged in so selling or shipping such substances for consumption as human food, which can or receptacle contains such foreign substance or which has not been rinsed as herein provided. The word "curd" as used in this section and section forty-six applies to the substance otherwise known as "pot cheese" or "cottage

Cleansing receptacles.

Evidence.

Cans in use.

Garbage, etc., in cans.

Unwashed cans.

Curd.

cheese." Whenever any such can or receptacle is used, returned, delivered or shipped in violation of this section, or of section forty-six of this chapter, every such use, return, delivery or shipment of each such can or receptacle shall be deemed a separate violation thereof. Such cans or receptacles so used, returned, delivered or shipped in violation of this section or of section forty-six may be seized by the commissioner of agriculture, his assistants or agents and held as evidence of such violation. For the proper enforcement of this section and section forty-six, the commissioner of agriculture may appoint two milk can inspectors to be stationed chiefly in the city of New York who shall receive the usual compensation of other agents of the department of agriculture. (*As amended by chapter* 608 *of the Laws of* 1911.)

Separate violation.

Can seizure.

Milk can inspectors.

People v. Frudenberg, 209 N. Y. 218, 155 App. Div. 199, 140 N. Y. Supp. 17, affd.

§ 48. **Manufacturer's brand of cheese.** Every manufacturer of whole-milk cheese may put a brand or label upon such cheese indicating "whole-milk cheese" and the date of the month and year when made; and no person shall use such a brand or label upon any cheese made from milk from which any of the cream has been taken. The commissioner of agriculture shall procure and issue to the cheese manufacturers of the state, on proper application therefor, and under such regulations as to the custody and use thereof as he may prescribe, a uniform stencil brand or labels bearing a suitable device or motto, and the words, "New York state whole-milk cheese." Every such brand or label shall be used upon the outside of the cheese and shall bear a different number for each separate factory. The commissioner shall keep a book, in which shall be registered the name, location and number of each manufactory using the brands or labels, and the name or names of the persons at each manufactory authorized to use the same. No such brand or labels shall be used upon any other than whole-milk cheese or packages containing the same. (*As amended by chapter* 207 *of the Laws of* 1910.)

Manufacturers' brand.

State brand.

Use of brand.

Record book.

§ 49. **Use of false brand prohibited; branding of skim-milk cheese regulated.** No person shall offer, sell or expose for sale, in any package, butter or cheese which is falsely branded or labeled.

Selling cheddar cheese.
Branding cheddar cheese.

No person shall sell, offer or expose for sale cheese commonly known as cheddar cheese made from skimmed or partially skimmed milk unless the same is branded to show that it is skim-milk cheese. All such cheese so sold, offered or exposed for sale shall be branded with the words "skim-milk cheese," or if such cheese contains thirteen per centum of milk fat or over, it may be branded "medium skim-milk cheese," or if it contains eighteen per centum of milk fat or over, it may be branded "special skim-milk cheese." Such branding shall be upon the sides of both the cheese and the container. The branding herein provided shall be in block letters at least one-half an inch square. (*As amended by chapter* 456 *of the Laws of* 1913.)

Adoption of county trade mark.
Filing trade mark.
Infringements.

§ 50. **County trade marks.** At a regular or special meeting of a county dairymen's association in any county of the state there may be adopted a county trade mark, by a majority of the members present and voting, to be used as a trade mark by a person manufacturing pure unadulterated butter or full-cream cheese in such county. The secretary of the association shall forthwith send to the commissioner of agriculture a copy of such trade mark, which copy he shall place on file in his office, noting thereupon the day and hour he received the same. But one county trade mark for butter and for cheese shall be placed on file for the same county. No association shall adopt any trade mark of any county already on file, or use that of any other county in the formation of a trade mark.

People v. Luhrs, 195 N. Y. 377.

Deception in dairy products.
Preservation of public health.

§ 51. **Object and intent of this article.** This article and each section thereof are declared to be enacted to prevent deception in the sale of dairy products, and to preserve the public health, which is endangered by the manufacture, sale and use of the articles or substances herein regulated or prohibited.

First violation.

§ 52. **Penalties.** Every person violating any of the provisions of this chapter, shall forfeit to the people of the state of New York the sum of not less than fifty dollars nor more than one hundred dollars for the first violation and not less than one hun-

Second violation.

Separate violation.

Penalties

dred dollars nor more than two hundred dollars for the second and each subsequent violation. When such violation consists of the manufacture or production of any prohibited article, each day during which or any part of which such manufacture or production is carried on or continued, shall be deemed a separate violation. When the violation consists of the sale, or the offering or exposing for sale or exchange of any prohibited article or substance, the sale of each one of several packages shall constitute a separate violation, and each day on which any such article or substance is offered or exposed for sale or exchange shall constitute a separate violation. When the use of any such article or substance is prohibited, each day during which or any part of which said article or substance is so used or furnished for use, shall constitute a separate violation, and the furnishing of the same for use to each person to whom the same may be furnished shall constitute a separate violation. Whoever by himself or another violates any of the provisions of articles three, four, six, eight and nine or sections three hundred fourteen and three hundred fifteen of this chapter or of sections one hundred six, one hundred seven and one hundred eight of this chapter shall be guilty of a misdemeanor, and upon conviction shall be punished by a fine of not less than fifty dollars, nor more than two hundred dollars, or by imprisonment of not less than one month nor more than six months or by both such fine and imprisonment, for the first offense; and by six months' imprisonment for the second offense.

Friedgood v. Kline, 67 Misc. Rep. (A. T.) 428, 123 N. Y. Supp. 247; **People v. Briggs**, 121 App. Div. 927; People v. Briggs, 193 N. Y. 457; **People v. Anton Koster**, 121 App. Div. 852; People v. Spencer as Trustee, 201 N. Y. 105 (vinegar cumulative penalties); **People v. Wiggins, 201 N. Y. 151 (not proper party def't.); People v. Martin, 88 Misc. 519, 151 N. Y. Supp. 69.**

§ 53. **Butterine and similar products not to be purchased by certain institutions.** No money appropriated by law for maintenance and support in whole or in part of a state institution; nor money received by a charitable, benevolent, penal or reformatory institution from the state, or from a county, city or town thereof, or appropriated by such county, city or town for the maintenance or support in whole or in part of such institution; nor money belonging to or used for the maintenance or support of such institution, shall be expended for the purchase of, or in payment for, butterine, oleomargarine, lard, cheese, or articles or products in imitation or semblance of natural butter or cheese produced from pure unadulterated milk or cream from the same, which articles or products have been rendered or manufactured in whole or in part from animal fats, or animal or vegetable oils not produced from unadulterated milk or cream from the same.

§ 54. **Purchase, sale and use of butterine and similar products prohibited in certain institutions.** No officer, manager, superintendent or agent of an institution mentioned in section fifty-three of this chapter, shall purchase for the use of such institution articles or products, for the purchase of which the money appropriated by law, or by a county, city or town, is forbidden to be used by section fifty-three of this chapter, and no person shall sell to, or for the use of such institution, such articles or products. Nor shall such articles or products be used as articles of food or for cooking purposes in such institutions withih this state.

§ 55. **Licensing of milk gathering stations where milk is bought.** On and after September first, nineteen hundred and thirteen, no person, firm, association or corporation, shall buy milk or cream within the state from producers for the purpose of shipping the same to any city for consumption or for manufacture unless such business be regularly transacted at an office or station within the state and unless such person, firm, association or corporation be duly licensed as provided in this and the ensuing sections of this article. Every such person, firm, association or corporation before engaging or continuing in the business of buying milk or cream for the purposes aforesaid, shall, annually, on or before August first, file an application with the commissioner of agriculture for a license to transact such business. The application shall state the nature of the business, as hereinabove set forth, the full name of the person or corporation applying for the license, and, if the applicant be a firm or association, the full name of each member of such firm, or association, the city, town or village and street number at which the business is to be conducted, and such other facts as the commissioner of agriculture shall prescribe. The applicant shall further satisfy the commissioner of his or its

Regulation in re. purchase of milk and cream.

License.

Application requirements.

character, financial responsibility and good faith in seeking to carry on such business. The commissioner shall thereupon issue to such applicant, on payment of ten dollars, a license entitling License fee. the applicant to conduct the business of buying milk and cream from producers for the purpose aforesaid at an office or station at the place named in the application until the first day of September next following; provided, however, that if the application be Duration of License. presented in the month of July, and if the applicant so elects, such license may be granted to begin on the first day of September next following and run for a term of one year. A license shall not be issued, however, to any applicant if during the year pre- Ground for refusing to issue license. ceding the filing of the application a complaint from any producer and seller of milk or cream shall have been filed with the commissioner against such applicant for any of the grounds specified in section fifty-seven hereof, and such complaint shall have been established as true and just to the satisfaction of the commissioner after such complaint shall have been investigated by the commissioner in the manner provided by section fifty-six hereof. A license shall not be issued as provided in this section, on and after the taking effect of this section, unless the applicant for such license shall file with the application a good and sufficient surety Bond. bond, executed by a surety company, duly authorized to transact business in this state, in a sum not less than five thousand dollars, or shall be relieved from such requirement as provided herein. Such bond shall be approved as to its form and sufficiency by the commissioner of agriculture.

Such applicant may in lieu of such bond deposit with the com- Securities in lieu of bond. missioner of agriculture money or securities in which the trustees of a savings bank may invest the moneys deposited therein, as provided in the banking law, in an amount equal to the sum secured by the bond required to be filed as herein provided.

The bond required to be filed hereunder shall be given to the Conditions of bond. commissioner of agriculture in his official capacity and shall be conditioned for the faithful compliance by the licensee with the provisions of this chapter, as hereby amended, and for the payment of all amounts due to persons who have sold milk or cream to such licensee, during the period that the license is in force. The Disposition and use of securities. money or securities deposited with the commissioner of agriculture, as above provided, shall constitute a separate fund and shall be held in trust for, and applied exclusively to, the payment of claims against the licensee making such deposit, arising from the sale of milk or cream to such licensee.

Default in payment by licensee.

Creditor may file verified claim or transcript of judgment with commissioner.

Upon default by the licensee in the payment of any money due for the purchase of milk or cream, which payment is secured by a bond or the deposit of money or securities as hereinbefore provided for, the creditor may file with the commissioner of agriculture, upon a form prescribed by him, a verified statement of his claim. If such creditor shall have reduced such claim to judgment or shall thereafter and before the commencement of the action by the commissioner of agriculture, as hereinafter provided for, reduce such claim to judgment, a transcript of such judgment shall also be filed with such commissioner.

Time of filing.

Such statements may be filled* at any time during the period of the license for purchases made during such period and within ninety days from the termination of such period.

Action by commissioner.

Enforcement of judgment.

Proof of claim in judgment.

After the expiration of ninety days from the termination of any license period the commissioner of agriculture shall, by proper action wherein all such creditors and any surety upon any bond given as hereinbefore provided for and the licensee shall be parties, proceed to determine the amount due each such creditor, and the judgment rendered in such action shall be enforced ratably for such creditors against the surety on the bond, if one there be, or against the moneys or securities deposited as hereinbefore provided for. If any such creditor shall have reduced his claim to judgment such judgment shall be presumptive proof of the amount due such creditor in any action brought by the commissioner of agriculture as hereinbefore provided for.

Application of proceeds of bond, first.

Second.

Every bond given pursuant to the provisions hereof shall be applicable, in the first instance, to the payment of all claims arising during the license period for which such bond shall continue, and filed either during such period or within ninety days after the expiration thereof. If all such claims shall be paid the balance available upon such bond shall be devoted to the extinguishment ratably of claims arising during such license period, but for which statements shall not have been filed until after ninety days after the expiration of such period.

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* So in the original.

All moneys and securities, deposited as herein provided for, shall be applicable, in the first instance, to the extinguishment of claims, properly filed, arising during the license period for which such moneys or securities were originally deposited and if, after the extinguishment of such claims, there shall be a surplus remaining such surplus shall be devoted to extinguishment of claims arising during any preceding license period which were properly filed as hereinbefore provided, all claims for any one license period to be of a parity. Any surplus remaining after the extinguishment of such prior claims shall be added to the moneys or securities then on deposit with the commissioner of agriculture or, if there be at that time on file with such commissioner a bond given pursuant to this section, or if there be then on deposit with such commissioner additional moneys or securities deposited as herein provided for, and if such bond or such moneys or securities, as the case may be, shall, in the opinion of the commissioner of agriculture, be sufficient, such surplus shall be returned to the licensee.

Application of money and securities, first.

Second.

Disposition of surplus.

A person or corporation licensed hereunder shall make a verified statement of his or its disbursements during a period to be prescribed by the commissioner of agriculture, containing the names of the persons from whom such products were purchased, and the amount due to the vendors thereof. Such statement shall be submitted to the commissioner of agriculture when requested by him and shall be in the form prescribed by such commissioner. If it appears from such statement or other facts ascertained by the commissioner of agriculture, upon inspection or investigation of the books and papers of such licensee as authorized by section fifty-six of this chapter, that the security afforded to persons selling milk and cream to such licensee by the bond executed or deposit made by such licensee as herein provided does not adequately protect such vendors, the commissioner of agriculture may require such licensee to give an additional bond or to deposit additional money or securities, to be executed or deposited as above provided, in a sum to be determined by the commissioner, but not exceeding by more than twenty-five per centum the maximum amount paid out by such licensee to sellers of milk in any one month: Provided, however, that the maximum amount of the bond or deposit required from any applicant under the provisions

Statement of disbursements.

Form of statement.

Additional bond or security may be required.

Maximum amount. of this section shall be one hundred thousand dollars; and that any applicant filing a bond or depositing money or securities in Exception. such maximum amount shall be exempted from filing either the statements of milk purchased, or the statements of disbursements in this section provided for.

Exception as to bond. If the applicant for a license under this section be a person or a domestic corporation, the commissioner of agriculture may, notwithstanding the provisions of this section, if satisfied from an investigation of the financial condition of such person or domestic corporation that such person or corporation is solvent and possessed of sufficient assets to reasonably assure compensation to probable creditors, by an order filed in the department of agriculture, relieve such person or corporation from the provisions of this section requiring the filing of a bond.

Definitions. The term "station" or "milk gathering station," as used in this and the ensuing sections of this article, shall include an established office where the business of buying milk or cream as herein provided is carried on, with or without a place or premises in connection therewith for the physical handling of milk or cream. (*As amended by chapter* 651 *of the Laws of* 1915.)

On complaint or by his own motion. § 56. **Power of commissioner to investigate.** The commissioner and his assistants shall have power to investigate upon the complaint of any interested person, or of his own motion, the record of any person, firm or corporation applying for or holding a license, or any transaction involving the purchase by such applicant or licensee or attempted purchase of milk for shipment as provided in section fifty-five; and for such purpose may examine the Examination of documents. ledgers, books of account, memoranda or other documents of any such person, firm, association or corporation applying for or holding a license and may take testimony therein under oath; but information relating to the general business of any such person, firm, association or corporation, disclosed by such investigation and not relating to the immediate purpose thereof shall be deemed of a confidential nature by the commissioner, his assistants, representatives and employees. When a complaint is filed with the Adjustment. commissioner, he shall attempt to secure an explanation or adjustment, and, failing this within ten days, he shall cause a copy of the complaint, together with a notice of the time and place for a hearing thereon, to be served personally or by mail upon said applicant or licensee. If served by mail, such complaint and notice shall be directed to the applicant or licensee at his place of business, with postage fully prepaid thereon. Such service shall be made at least seven days before the hearing. At the time and place appointed for such hearing, the commissioner or his assistants shall hear the parties to the complaint, shall have power to administer oaths and shall enter in the records of the office of the commissioner of agriculture a decision either dismissing such complaint or specifying the facts which he deems established on such hearing. (*As added by chapter* 408 *of the Laws of* 1913.)

Service of complaint.

Time and place of service.

Hearing.

§ 57. **Granting and revoking licenses.** The commissioner of agriculture may decline to grant a license or may revoke a license already granted when he is satisfied of the existence of the following cases or either of them:

1. Where a money judgment has been secured by any milk producer and has been entered against such applicant or licensee and remains unsatisfied of record. **Judgment against applicant.**

2. Where there has been a failure to make prompt settlements to persons from whom he buys milk, with intent to defraud. **Intent to defraud vendor.**

3. Where there have been combinations to fix prices. **Combinations.**

4. Where there has been a continual course of dealing of such nature as to satisfy the commissioner of the inability of the applicant or licensee to properly conduct the business or of an intent to deceive or defraud customers. **Intent to defraud customers**

5. Where there has been a continued and persistent failure to keep records required by the commissioner or by law. (*As added by chapter* 408 *of the Laws of* 1913.) **Failure to keep records.**

§ 58. **Certiorari to review.** The action of the commissioner of agriculture in refusing to grant a license, or in revoking a license granted under section fifty-five, shall be subject to review by writ of certiorari, and if such proceedings are begun to review the revocation of license, the license shall be deemed to be in full force and effect until the final determination of certiorari proceedings and all appeals therefrom. (*As amended by chapter* 651 *of the Laws of* 1915.)

§ 59. **Records to be kept.** Every proprietor of a milk gathering station shall keep, in such form as the commissioner of agriculture may prescribe, a record of transactions of purchases of milk or cream by him and he shall, at least semi-monthly, deliver to each person from whom he receives or purchases milk or cream, and in the unit of measure used in computing the amount due therefor, an itemized statement of the several amounts or quantities of such milk or cream so received or purchased at such milk station from such person during the prior half month or, if statements are delivered more frequently than semi-monthly during that period of time which has elapsed since the delivery of such last prior statement. If the milk or cream is purchased or received on a butter fat basis, such statement shall include the percentage, or average percentage of butter fat contained in said milk or cream as determined by tests periodical or otherwise. Every such proprietor of a milk gathering station shall post in a conspicuous place in such milk station, a schedule of the prices being paid for milk or cream including the premiums paid or deductions made, if any, for milk or cream containing milk fat either in excess or in lesser amount than the agreed standard, and shall keep a correct account of all the milk or cream daily received or purchased from each person at such milk station which account shall be open to inspection by said person. (*As amended by chapter* 651 *of the Laws of* 1915.)

Semi-monthly statements.

§ 60. **Right to review.** If either party to the transaction of purchase and sale between a milk producer or a milk seller and a licensed buyer of milk shall be dissatisfied relative to any transaction of purchase and sale of milk between a milk seller and a licensed buyer of milk, he may apply to the commissioner of agriculture, in writing, within sixty days after the delivery of such milk to the licensed buyer, for investigation. The commissioner of agriculture shall treat such application as a complaint. and shall cause a full investigation of the transaction complained of to be made either by himself or one of his assistants, in the manner provided by section fifty-seven. (*As added by chapter* 408 *of the Laws of* 1913.)

Dissatisfied party may apply for investigation.

§ 61. **Offenses.** Any person who, being a buyer of milk for shipment for the purposes set forth in section fifty-five, whether such person be licensed or whether his business be transacted at a station or otherwise, shall (a) fail to make prompt payments for milk purchased, with intent to defraud, or (b) shall make any false or misleading statement or statements enumerated in sections fifty-five to fifty-nine inclusive, with intent to deceive, or (c) enter into any combination to fix prices, or (d) not being licensed, shall conduct the business of buying milk for shipment as provided in section fifty-five, or (e) being licensed or otherwise, engages in such business without having a station or office therefor, or (f) fails to conform to any requirement of or violates any provision of sections fifty-five to fifty-nine, inclusive, with intent to deceive a seller of milk, shall be guilty of a misdemeanor. (*As added by chapter* 408 *of the Laws of* 1913.) Misdemeanors.

§ 62. See note.

§ 63. See note.

§ 64. See note.

NOTE.— These sections did not become law.
NOTE.— Section 64-a follows section 95.

ARTICLE 4

Adulterated Vinegar

Section 70. Definition of cider vinegar and adulterated vinegar.
71. Manufacture and sale of adulterated or imitation vinegar prohibited.
72. Packages containing vinegar to be branded.
73. Facts published.

Cider vinegar.

Adulterated vinegar.

§ 70. **Definition of cider vinegar and adulterated vinegar.** The term " cider vinegar " as used herein shall be construed to mean vinegar made exclusively from pure apple juice. All vinegar which contains any proportion of lead, copper, sulphuric acid or other ingredients injurious to health, or any artificial coloring matter, or which has not an acidity equivalent to the presence of at least four per centum, by weight, of absolute acetic acid, or cider vinegar which has less than such an amount of acidity, or less than two per centum of cider vinegar solids shall be deemed adulterated. (*As amended by chapter* 210 *of the Laws of* 1909, *and by chapter* 26 *of the Laws of* 1912.)

People v. Albion Cider and Vinegar Co., 118 N. Y. Supp. 15; People v. Girard, 145 N. Y. 105; People v. Heinz Co., 90 App. Div. 408; People v. Niagara Fruit Co., 75 Id. 11, 173 N. Y. 629; People v. Windholz, 68 App. Div. 552; People v. Windholz, 92 Id. 569 (constitutional question); Rossano v. Kaminsky, 134 N. Y. Supp. 895; Friedgood v. Kline, 67 Misc. 428, 123 N. Y. Supp. 247.

§ 71. **Manufacture and sale of adulterated or imitation vinegar prohibited.** No person shall manufacture for sale, keep for sale or offer for sale:

1. Any adulterated vinegar.

2. Any vinegar or product in imitation or semblance of cider vinegar, which is not cider vinegar.

3. As or for cider vinegar, any vinegar or product which is not cider vinegar.

Branding.

False branding.

§ 72. **Packages containing vinegar to be branded.** Every manufacturer or producer of vinegar shall plainly brand each cask, barrel, or other container of such vinegar with his name and place of business, the kind of vinegar contained therein and the substance or substances from which it was made. And no person shall mark or brand as or for cider vinegar any package containing that which is not cider vinegar. Every person who sells any vinegar, except it be delivered to the purchaser in the unbroken package in which such seller received it, shall plainly and conspicuously mark or brand the receptacle or container in which such vinegar is delivered to the purchaser, whether such receptacle or container be furnished by the seller or purchaser, with a label showing the kind of vinegar so delivered and the substance or substances from which it was made. Nothing herein shall be deemed to prohibit the sale of cider vinegar stock, provided it be sold as and for such in compliance with the provisions of this article as to marking or branding. The term " cider vinegar stock " when used herein, shall be construed to mean acetified apple juice of less acidity than that required for vinegar which contains not less than two per centum of apple solids and sufficient alcohol to develop the acidity required in vinegar. (*As amended by chapter* 210 *of the Laws of* 1909, *and by chapter* 228 *of the Laws of* 1911.)

Marking container.

Cider vinegar stock.

People v. Luhrs, 195 N. Y. 377 (trade marks).

§ 73. **Facts published.** The commissioner of agriculture shall publish the name and business address of each person, firm or corporation convicted of a violation of this article, with such statement of the facts of the violation as he may deem proper. (*As amended by chapter* 210 *of the Laws of* 1909 *and by chapter* 156 *of the Laws of* 1910.)

ARTICLE 5

Diseases of Domestic Animals

Section 90. Suppression of infectious and contagious disease.
91. Commissioner to issue notice.
92. Farms to be quarantined; inspection of premises.
93. Detention and destruction of animals.
94. Care of diseased animals; experiments.
95. Employment of veterinary surgeons.
*64-a. Tuberculin, issuing certificates relative to tuberculin tested cattle, branding of tuberculous animals.
96. Regulations, the enforcement thereof and expenses incurred by sheriff.
97. Fines and penalties.
98. Bureau of veterinary service; chief veterinarian; appraisers.
99. Appraisal of diseased animals.
100. Certificate of appraisal.
101. Post-mortem examination of animals.
102. Compensation of owners of animals destroyed.
103. Expenses.
104. Compensation for slaughter of animals on account of foot and mouth disease or anthrax.
105. Rights of federal inspectors. (Repealed by chapter 232 of the Laws of 1909.)
106. Shipping, slaughtering and selling veal for food.
107. Shipping veal.
108. Receiving veal for shipment by common carriers.

Wilful importation of diseased animals.

§ 90. **Suppression of infectious and contagious diseases.** No person shall knowingly bring any domestic animal into this state which is suffering with an infectious or contagious disease. Any person knowingly bringing a domestic animal suffering with an infectious or contagious disease into this state shall be liable to and shall pay all damages, suffered or caused by the spreading of such disease, to the owner or owners of animals to which such disease is imparted by such animal or animals so brought in, as liquidated damages in addition to the penalties to the state of New York,

Damage for violation.

Interstate traffic.

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* So numbered in original.

as provided in section fifty-two of the agricultural law; provided that nothing herein contained shall be construed to prevent or make unlawful the transportation of such animals through this state on railroads or boats. Any person bringing into the state such animals which are used for breeding, feeding or dairy purposes without taking due precaution to ascertain whether such animals are suffering with such a disease shall be presumed to have brought them in knowingly and in violation of the statute. Under the foregoing provisions of this section, any animals, received from outside the state and distributed under the supervision of the United States department of agriculture or the state department of agriculture and for which a permit or certificate has been issued by either of said departments, shall be deemed to have been handled with due precaution. Whenever any infectious or contagious disease affecting domestic animals shall exist, be brought into or break out in this state the commissioner of agriculture shall take measures to promptly suppress the same, and to prevent such disease from spreading. The local boards of health shall notify the commissioner of the existence of infectious or contagious disease affecting domestic animals in the districts subject to their jurisdiction. Any person importing or bringing into this state neat cattle for dairy or breeding purposes shall report immediately upon bringing such cattle into the state to the commissioner of agriculture in writing, giving a statement of the number of cattle thus brought in, the place where they were procured, the lines over which they were brought and their point of destination within the state, stating when they will arrive at such point of destination, and upon the filing with the commissioner of agriculture at the time of making the said report, a certificate issued by a duly authorized veterinary practitioner, to the effect that he has duly examined said animals and that said animals are free from any infectious or contagious disease, the commissioner of agriculture may issue a permit to said person to remove said cattle immediately. Otherwise, said person shall hold or detain such animals at least ten days at such point of destination for inspection and examination, provided they are not sooner examined or inspected, by the commissioner of agriculture or his duly authorized agent. Each animal brought into

Due precaution.

Prompt action required.

Boards of health to notify commissioner.

Report of cattle imported.

Permit to remove.

Detention for inspection.

Separate violation. the state in violation of the above provisions shall constitute a separate and distinct violation of this chapter. The provisions Exceptions. of this section, relating to the importation of neat cattle for dairy or breeding purposes, shall not apply to cattle imported into this state at a point where there is federal inspection, so far as the same shall relate to making advance reports to the commissioner of agriculture. But parties importing or receiving such cattle at Information to commissioner. such places shall give such information to the commissioner of agriculture as he may from time to time request relative to such cattle so imported or brought in. (*As amended by chapter* 240, § 1, *and chapter* 312 *of the Laws of* 1909.)

§ 91. **Commissioner to issue notice.** He shall issue and publish a notice, stating that a specified infectious or contagious disease exists in the state or in any designated county or other geographical Seclusion of animals. district of the state, and warning all persons to seclude in the premises where they may be at the time, all animals within the state or within such county or district or an adjoining county or district, that are of a kind susceptible to contract such disease, and ordering all persons to take such precaution against the spreading of the disease, as the nature thereof may in his judgment render necessary or expedient, and which he may specify in such Publishing notices. notice. Such notice shall be published in such newspapers, and be posted in such manner as the commissioner may designate, and as, in his judgment, are most likely to give notice thereof. For Posting notices. this purpose he may post notices on public service poles other than those carrying wires transmitting electricity for light or power or fences upon the highway or buildings abutting upon the highway, provided, if such fences or buildings are privately owned, the Destroying notices. owners thereof shall consent to such posting. No person shall tear down, mutilate, deface or destroy any such notice or order issued by the commissioner of agriculture and posted as provided herein during the pendency of said order or notice. (*As amended by chapter* 313 *of the Laws of* 1909.)

§ 92. **Farms to be quarantined; inspection of premises.** The commissioner or an assistant commissioner or the chief veterinarian, shall order any premises, farm or farms where such disease exists, or recently existed, to be put in quarantine, so that no domestic animal be removed from or brought to the premises or places quarantined, and shall prescribe such regulations as he may judge necessary or expedient to prevent the communication of the disease by infection or contagion, in any way from the places so quarantined. The commissioner may adopt and enforce rules regulating the sanitation of stables and other buildings used for the stabling of cattle for the purpose of preventing the existence and spread of infection and contagion among cattle. He may provide for the inspection and examination of all such stables and buildings. (*As amended by chapter* 315 *of the Laws of* 1909.)

Quarantine.

Sanitation of stables.

Inspection of stables.

§ 93. **Detention and destruction of animals.** The commissioner or an assistant commissioner or the chief veterinarian may order all or any animals coming into the state to be detained at any place or places for the purpose of inspection and examination. The commissioner may prescribe regulations for the destruction of animals affected with infectious or contagious disease, and for the proper disposal of their hides and carcasses, and of all objects which might carry infection and contagion. Whenever in his judgment necessary for the more speedy and economical suppression or prevention of the spread of any such disease, he may cause to be slaughtered, and to be afterward disposed of, in such manner as he may deem expedient, any animal or animals, which, by contact or association with diseased animals, or by other exposure to infection or contagion, may be considered or suspected to be liable to contract or communicate the disease sought to be suppressed or prevented. The commissioner may direct that an animal shall be condemned, quarantined or slaughtered as tuberculous, under the provisions of this article, if it shall be found to be tuberculous by a physical examination. If the owner of animals suspected of being tuberculous desires to have such animals tested with tuberculin and enters into written agreement with the state in the manner prescribed by the commissioner of agriculture, before such test is made, to the effect that he will disinfect his premises and either consent to the slaughter of the animals responding to such test, or hold them and their products in strict quarantine, pursuant to the directions of the commissioner of agriculture,

Detention of animals entering the state.

Disposal of hides, etc.

Destruction of animals.

Tuberculosis.

Physical examination.

Tuberculin test.

such test shall be made by a medical or veterinary practitioner designated by the commissioner. The commissioner may also in his discretion order such tuberculin test to be made, and if the animal responds to such test, he may cause such animal to be slaughtered or held in strict quarantine. (*As amended by chapter* 315 *of the Laws of* 1909.)

Slaughter or quarantine.

§ 94. **Care of diseased animals; experiments.** If after examination an animal is, in the judgment of the person making the examination, suffering from tuberculosis, such animal shall be slaughtered under the provisions of this article, or, if the commissioner deems that a due regard for the public health warrants it, he may enter into a written agreement with the owner, subject to such conditions as the commissioner of agriculture may prescribe, for the separation and quarantine of such diseased animal or animals. Subject to the regulations of the department of agriculture, such diseased animal or animals may continue to be used for breeding purposes and its or their milk, after pasteurization at one hundred and eighty-five degrees Fahrenheit, may be used for the manufacture of butter or cheese or for sale. The young of any such diseased animal or animals shall, immediately after birth, be separated from their mothers, but may be fed the milk drawn from such affected animal or animals so separated and quarantined after such milk has been pasteurized as herein provided. The owner of a herd of cattle, within the state, may apply to the commissioner of agriculture for examination of his herd by the tuberculin test; said application to be in writing upon a blank form provided by the commissioner of agriculture and to include an agreement on the part of the owner or owners of the herd to improve faulty sanitary conditions; to disinfect his premises, should diseased cattle be found, and to follow instructions of the commissioner of agriculture designed to prevent the reinfection of the herd and to suppress the disease or prevent the spread thereof. The commissioner of agriculture shall, as soon as practicable, cause such cattle to be examined accordingly, subject to the provisions of this chapter. When the commissioner deems that the conditions warrant it he may make and issue to such owner a certificate that upon such examination such herd was found free from tuberculosis or that the owner has complied

Quarantined animals.

Young of diseased animals.

Application for tuberculin test.

Certificate of health of herd.

with the provisions of this section by causing all affected animals to be separated from the herd and quarantined as provided herein subject to the regulations of the department of agriculture. The commissioner of agriculture may determine the place of slaughter of an animal to be killed under the provisions of this chapter. The commissioner may experiment or cause such experiments to be made or performed as he may deem necessary to ascertain or determine the best methods or means for the control, suppression or eradication of communicable or infectious disease or diseases affecting domestic animals. No person shall sell any animal known to have a communicable or infectious disease except for immediate slaughter unless such sale be made under a written contract signed by both parties specifying the disease with which such animal is infected, a copy of which shall be filed in the office of the commissioner of agriculture. No person shall knowingly inject into any bovine animal as and for tuberculin any substance which is not tuberculin.

Place of slaughter.

Experiments.

Sale of diseased animals.

Substitute for tuberculin.

§ 95. **Employment of veterinary surgeons.** The commissioner may employ such and so many medical and veterinary practitioners and such other persons as he may, from time to time, deem necessary to assist him in discharging the duties imposed upon him by this article, and may fix their compensation, to the amount appropriated therefor. No animal shall be destroyed by the commissioner or by his order on the ground that it is a diseased animal, unless first examined by a veterinary practitioner in the employ of the commissioner or whose work is approved by the commissioner, nor until such practitioner renders a certificate to the effect that he has made such examination, that in his judgment such animal is affected with a specified infectious or contagious disease, or that its destruction is necessary in order to suppress or aid in suppressing such disease, or to prevent such disease, or to prevent the spread thereof, specifying the reasons for such necessity. (*As amended by chapter* 316 *of the Laws of* 1909.)

Assistants.

Compensation.

Animals destroyed only on certificate of veterinarian.

*§ 64-a. **Tuberculin, issuing certificates relative to tuberculin tested cattle, branding of tuberculous animals.** Any person using

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* This section erroneously numbered 64-a; apparently intended to follow § 95, which was § 64 of former Agricultural Law.

or injecting tuberculin into bovine animals for the purpose of determining whether they are affected with the disease known as tuberculosis, shall take the temperatures of such animals before, during and after such injections, according to the most approved methods, shall keep a correct record of such temperatures so taken and shall send a report within one week thereafter to the commissioner of agriculture giving a detailed account of the tests thus made, including the description of animals, the location of the farm or farms upon which tests were made and the name and address of the owner or custodian, and such other information concerning the use of tuberculin as may be called for by the commissioner of agriculture. A report of each such test so made shall be accompanied by a statement of the owner or person in charge giving the date upon which the said animals were last tested, if at all, and if known, with tuberculin, and the name and address of the person or persons making such test. If no such test has been made within four weeks, or if the animals were not treated in any manner for the purpose of preventing their normal reaction to tuberculin, then the report shall be accompanied by a statement setting forth such facts and the said statement shall be duly verified by the person making such statement. No person shall give a certificate showing or tending to show that an animal has been tested and found not affected with tuberculosis, unless the character of such test is stated and it was made in a proper way, and unless such animals failed to give a typical reaction. Any bovine animal in which tuberculosis is clearly diagnosed by a physical examination or a tuberculin test, or both, shall be branded upon the forehead or upon the right side of the neck from six to ten inches back of the jaw bone with a capital "T" not less than two inches high, one and one-half inches wide, with mark one-fourth of an inch wide; such branding shall not be construed as cruelty to animals within the meaning of the penal law; however, any animal which has reacted to the tuberculin test and appears physically sound may be retained for breeding or dairy purposes without such branding, provided a full description of such animal, sufficient for its identification and satisfactory to the commissioner of agriculture, is furnished to the commissioner of agriculture and a permit from said commissioner is issued for keeping such ani-

Taking temperature.

Record of temperatures.

Report to commissioner.

Previous test.

Certificate.

Branding tuberculous animals.

Exceptions.

mal in such manner. Such permit shall not be issued except upon the condition that the animal will thereafter be kept in a proper manner with regard to the protection of the public health and the health of other animals, and no such animal shall be sold or removed from the premises without written permission from the commissioner of agriculture, and all such animals shall be accounted for by the owner or custodian whenever called upon by the commissioner of agriculture to do so. All tuberculin sold, given away or used within this state, shall bear a label stating the name and address of the person or firm or institution making it and the date of preparation. All persons selling or giving away tuberculin shall report to the commissioner of agriculture the amount of tuberculin sold or given away, the degree of strength, the name and address of the person to whom sold or given and the date of delivery; said report shall include the address of and be signed by the person making it. Persons buying or procuring tuberculin shall not use or dispose of it until assured in writing by the person from whom the tuberculin is received that its delivery to said person has been reported to the commissioner of agriculture or unless they have themselves reported its receipt to the commissioner of agriculture with information required to be furnished by those who distribute tuberculin, and such persons buying or procuring tuberculin shall keep a correct record of the amount received, the amount used and the amount on hand and shall report these facts whenever any tuberculin is used, and if at any time tuberculin left on hand is not deemed fit for use or is not to be used, the said person shall forward the same to the commissioner of agriculture with a statement of where and when procured, the amount procured at the time, the amount of it that was used, and his name and address. If the amount forwarded to the commissioner of agriculture and the amount used does not total the amount procured or purchased a statement shall be made as to what became of the remainder. No person or persons shall treat any bovine animal with any material or substance nor in any manner for the purpose of preventing a normal reaction on the part of such animal to the tuberculin test. No person shall knowingly sell or offer for sale any animal that has reacted to the tuberculin test, without giving information of such reaction to the purchaser. No

Issuing permit for exemption.

Label for tuberculin.

Report of distribution of tuberculin.

Tuberculin accounted for.

Treatment to prevent reaction

Sale of reacting animals.

Removal. animal that has reacted to the tuberculin test shall be sold or removed from the premises where the test was made without permission in writing from the commissioner of agriculture. Any Penalties. veterinary surgeon violating any of the provisions of this section shall, in addition to the penalties and fines prescribed in the agricultural law, forfeit his certificate to practice and thereafter be debarred from practicing his profession within the state of New York until such disability is legally removed. (*As added by chapter* 588 *of the Laws of* 1909.)

Regulations for suppression of disease. § 96. **Regulations, the enforcement thereof and expenses incurred by sheriff.** The commissioner may prescribe such regulations as in his judgment may be thought suited for the suppression or the prevention of the spread of any such disease, and for the disinfection of all premises, buildings, railway cars, vessels, and other objects from or by means of which infection or contagion Modification of notice. may take place or be conveyed. He may alter or modify, from time to time, as he may deem expedient, the terms of all notices, orders and regulations issued or made by him, and may at any Sheriff to enforce. time cancel or withdraw the same. He may call upon the sheriff, under sheriff or deputy sheriff, to carry out and enforce the provisions of any notice, order or regulation which he may make, and all such sheriffs, under sheriffs and deputy sheriffs shall obey and observe all orders and instructions which they may receive from him Expense incurred by sheriff. in the premises. In all counties, the expenses incurred by the sheriff, under sheriff or a deputy sheriff in carrying out and enforcing the provisions of such notice, order or regulation shall be a county charge, to be audited and paid in the same manner as other charges by the sheriff, under sheriff or deputy sheriff, including in this requirement any county affected by a local or special act relating to the sums payable by the county for compensation or disbursements, or both, to its sheriff, under sheriff or any deputy sheriff; and no such local or special act shall be effectual to prevent the payment of the expenses herein made a county charge over and above any other sum or sums, fixed or otherwise, provided in such act to be paid by the county to the sheriff, under sheriff or deputy sheriffs for compensation or to cover expenses, or both, and notwithstanding any provision of any such act relieving the county from charges imposed by law which are incurred by its sheriff, under sheriff or a deputy sheriff. If the commissioner shall lay a quarantine upon a city or any portion thereof he may call upon the commissioner of public safety and the police department of said city to enforce the provisions of any notice, order or regulation which he may make within the quarantine district or such portion thereof as lies within the city limits, and the commissioner of public safety and the police department shall obey and observe all such orders and instructions so made or issued, and all expenses incurred by the commissioner of public safety and the police department in enforcing the quarantine as herein provided shall be a city charge. If the commissioner shall quarantine any particular district or territory for the purpose of stopping or preventing the spread of the disease known as rabies, and if any dog be found within the said quarantine district in violation of said quarantine or regulation, any person may catch or cause to be caught such dog and have him impounded or confined. If the said dog is thereafter not found to be affected with the disease known as rabies, it may be released to the owner upon payment of a penal sum of ten dollars to the commissioner of agriculture, who shall upon receipt and acceptance of the same issue to the said owner a release which shall entitle the said owner to the possession of said dog. If such penalty is not paid within three days after said dog is impounded, or if it is found impracticable after reasonable effort to catch and impound such dog within the said quarantine district in violation of said quarantine or regulation, or to find the owner of a dog so impounded, then any person may kill or cause to be killed such dog and shall not be held liable for damages for such killing. For the purpose of enforcing the provisions of this article the commissioner of agriculture, his appointees and employees shall be considered as peace officers and shall have all the rights and powers of peace officers. (*As amended by chapter* 255 *of the Laws of* 1911.)

Police to enforce.

Expense incurred by police.

Dogs in violation of quarantine.

Release.

Provisions for killing.

Powers of peace officers.

People ex rel. Baumann v. Lyon, 77 Misc. 377, 155 App. Div. 266; 136 N. Y. Supp. 534.

§ 97. **Fines and penalties.** Any person violating, disobeying or disregarding the term of any notice, order or regulation issued or prescribed by the commissioner under this article shall forfeit to

Fines.

the people of the state the sum of not less than fifty dollars nor more than one hundred dollars for every such violation. Any person violating, disobeying or disregarding the terms of any notice, order or regulation issued or prescribed by the commissioner under this article shall be guilty of a misdemeanor and shall be fined not less than fifty dollars nor more than one hundred dollars for each separate offense or by imprisonment of not less than one month nor more than six months, or by both such fine and imprisonment, except that in the case of rabies he shall be fined not less than ten dollars nor more than one hundred dollars for each offense or by imprisonment of not less than one month *not more than six months, or by both such fine and imprisonment. (*As amended by chapter* 352 *of the Laws of* 1909.)

Penalties.

Rabies violation.

People v. Shields, 142 App. Div. 194.

§ 98. **Bureau of veterinary service; chief veterinarian; appraisers.** There is hereby established in the department of agriculture a bureau of veterinary service. The bureau shall be in charge of a chief veterinarian, who shall be an experienced veterinarian appointed by the commissioner of agriculture. He shall receive an annual salary of three thousand dollars and all necessary traveling and other expenses incurred in the performance of his duties. Such chief veterinarian or other veterinarians employed by the commissioner shall have all the powers of an appraiser of condemned animals under this article. The chief veterinarian shall, under the direction of the commissioner of agriculture, have general charge of the enforcement of the provisions of this article, and shall collect and disseminate through farmers' institutes or otherwise, as the commissioner may direct, information and statistics in relation to the diseases of domestic animals, the proper care and sanitation of stables and other buildings used for the stabling of farm animals for the purpose of preventing the existence and spread of infectious and contagious diseases, the methods of feeding, the methods of improving the breed or milking qualities of cattle, and such other matters as the commissioner may direct. All veterinarians in the state shall immediately report to the commissioner of agriculture the existence among animals of any in-

Chief veterinarian.

Appointment.

Compensation.

Duty and powers of veterinarians.

Report of disease.

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* So in the original.

fectious or communicable disease coming to their knowledge. The report shall be made in writing and shall include a description of the diseased animal or animals, the name and address of the owner or person in charge of the animal, if known, and a statement as to the location of the animal. No person shall conceal or attempt to conceal any animal suffering from an infectious or communicable disease so that the same shall not come to the knowledge of the commissioner of agriculture. The commissioner of agriculture may appoint and at pleasure remove two confidential agents at salaries not to exceed eighteen hundred dollars, to be fixed by the commissioner, to assist in carrying out the provisions of this article. He may appoint and at pleasure remove one state appraiser of condemned animals, who shall be a person of experience and well acquainted with the value of farm animals; and shall receive an annual salary of fifteen hundred dollars, and all necessary traveling and other expenses incurred in the performance of his duties. The commissioner of agriculture may employ from time to time such additional appraisers of condemned animals as the work of his department may necessitate, who shall receive compensation at the rate of five dollars per diem and all traveling and other expenses necessarily incurred while engaged in the performance of their duties.

Concealment of disease.

Confidential agents.

State appraiser.

Additional appraisers.

§ 99. **Appraisal of diseased animals.** An appraiser shall determine the value of each animal directed to be slaughtered. Such value shall be the market value of such animal at the time of making the appraisement, but the appraisal value of each bovine animal shall not exceed the sum of one hundred and twenty-five dollars, provided however that the appraised value shall not exceed the sum of seventy-five dollars, except for registered thoroughbred animals, and the appraisal of each equine animal shall not exceed the sum of one hundred and twenty dollars. If the value of the condemned animals determined by the appraiser is not satisfactory to the owner of such animals, the value shall be determined by arbitrators, one to be appointed by the state appraiser and one by the owner of the animals. If such arbitrators are not able to agree as to the value of the animals, a third arbitrator shall be appointed by them. The value determined by such arbitrator

Appraised value.

Arbitration of value.

shall not exceed the limits established by this article and, after approval by the commissioner of agriculture, shall be final. The arbitrators selected by the owner of the animals shall be paid by the said owner, the other arbitrator or arbitrators shall be paid by the state at a rate of compensation not to exceed five dollars per day and necessary expenses. Such appraiser of condemned animals and the arbitrators appointed under this section may administer oaths to and examine witnesses. (*As amended by chapter* 314 *of the Laws of* 1909 *and by chapter* 670 *of the Laws of* 1910.)

Payment of arbitrators.

Powers of arbitrators.

Certificate.

§ 100. **Certificate of appraisal.** The appraiser shall execute and deliver to the owner of the condemned animals a certificate verified by him stating the appraised value of such animals; if such value was determined by arbitrators, there shall be attached to such certificate a statement of the value so determined, signed and verified by at least two of the arbitrators. The form and contents of such certificates shall be prescribed by the commissioner of agriculture.

Statement of value.

Form and contents.

Post-mortem examination.

§ 101. **Post-mortem examination of animals.** All animals suspected of being tuberculous or glandered, and killed therefor, shall be examined by a medical or veterinary practitioner designated by the commissioner for the purpose of determining whether or not such disease existed in such animals. There shall be attached to the certificate of appraisal, a statement of the result of such examination, describing the animals found to be tuberculous or glandered and those which were found not to be tuberculous or glandered. The form of such statement shall be prescribed by the commissioner of agriculture. Such statement shall be verified by the veterinary or medical practitioner making the examination. (*As amended by chapter* 314 *of the Laws of* 1909.)

Statement of result.

Form of statement.

Verification of statement.

Payment when not diseased.

§ 102. **Compensation of owners of animals destroyed.** The actual appraised value at the time they are killed of all animals killed under the provisions of this article, which shall be found upon a post-mortem examination not to have had the disease for which they were killed, unless the same were killed on account of the violation of quarantine regulations, shall be paid to the owners of such animals. If such animals are found, upon post-mortem examination, to have been suffering from glanders then they shall be paid for in the manner following: If an animal has glanders, not manifest by clinical symptoms, the owner thereof shall be paid eighty per centum of the appraised value. If the animal has glanders showing clinical symptoms, the owner thereof shall be paid therefor fifty per centum of the appraised value. If such animals are found upon post-mortem examination to have been suffering from tuberculosis, then they shall be paid for in the manner following, to wit: If an animal has localized tuberculosis, the owner thereof shall be paid eighty per centum of the appraised value. If the animal has generalized tuberculosis, the owner thereof shall be paid therefor fifty per centum of the appraised value, but no animal slaughtered under the provisions of this article shall be paid for as herein provided, unless the said animals shall have been within the state for a period of at least six months if suffering from tuberculosis or twelve months if suffering from glanders. If the meat of the slaughtered bovine animal shall be passed for use as food, under official regulations, the commissioner of agriculture is hereby authorized to sell the same and the proceeds from the sale of the meat, hide and other marketable parts of the said animal shall be paid into the state treasury. For each and every day the owner or custodian of the animals condemned is obliged to keep them, in excess of seven days from the date of the condemnation, he shall be allowed and paid the sum of twenty-five cents per day per head. The owner of animals condemned and slaughtered, as provided herein, shall be entitled to interest on the amount due, as herein provided, from and after thirty days from the time such animals are so slaughtered. The certificate of appraisal, and the statement of the result of the post-mortem examination, shall be presented by the owner or his legal representatives or assigns, to the commissioner of agriculture. The commissioner of agriculture shall issue his order for the amount due as shown by such certificate and statement, after he has found them to be correct, which shall be paid by the state treasurer on the warrant of the comptroller out of moneys appropriated therefor. No compensation shall be made to any person

Payment when diseased.

Glanders.

Tuberculosis.

Disposal of meat.

Payment for keeping condemned animals.

Interest on amount due.

Refusal of compensation.

who has wilfully concealed the existence of disease among his animals or upon his premises, or who in any way by act or by wilful neglect has contributed to spread the disease sought to be suppressed or prevented, ncr for any animal which upon a post-mortem examination is found to have the disease on account of which it was slaughtered or any dangerously contagious or infectious disease that would warrant the destruction of such animal, except as herein provided. (*As amended by chapter* 28 *of the Laws of* 1914.)

§ 103. **Expenses.** All expenses incurred by the commissioner in carrying out the provisions of this article and in performing the duties herein devolved upon him shall be audited by the comptroller as extraordinary expenses of the department of agriculture, and paid out of any moneys in the treasury appropriated for such purposes.

§ 104. **Compensation for slaughter of animals on account of foot and mouth disease or anthrax.** In the event of the breaking out within the state of foot and mouth disease or anthrax, the control, suppression or eradication of which involves the general condemnation and slaughter of cattle, sheep or swine and the disposal of the carcasses thereof by state authorities in the interest of public health and welfare, the owner of each such animal slaughtered shall receive compensation for each animal slaughtered. The amount to be paid for each animal, pursuant to the provisions of this section, shall be fixed by a board of appraisal, to consist of the commissioner of agriculture, or his duly accredited representative, and a representative of the owner, appointed by the owner. If in any case the members of such board fail to agree, they shall choose a third member of such board, and the findings of a majority shall be final. Valuations in all cases shall be made on the basis of the utility value of the slaughtered animals as producing and breeding animals. The determination of such board as to the amount to be paid by the state to any owner for any such animal shall be final, and a certificate of appraisal shall be issued under the hands of a majority of such board to the owner. Such certificate shall be verified by the members of the

Board of appraisal.

Determination of valuation.

How paid.

Interest.

board of appraisal signing the same. The amounts found to be due by an appraisal under this section shall be paid, upon the audit and warrant of the comptroller, to the owners entitled thereto, upon presentation of proper certificates of appraisal. Awards not paid within thirty days from the making thereof shall bear interest at the rate of six per centum per annum, unless moneys appropriated therefor were available within said thirty days. The other provisions of this article relating to appraisal and amount of compensation shall not apply to the destruction of animals under this section where the conditions exist as herein provided. (*As added by chapter* 586 *of the Laws of* 1915.)

(Section 105 *repealed by chapter* 232 *of the Laws of* 1909.)

Sale of calves.

Shipment of calves.

Presumption.

Method of shipping.

Calves for fertilizer purposes.

§ 106. **Shipping, slaughtering and selling veal for food.** No person shall slaughter or expose for sale, or sell any calf or carcass of the same or any part thereof, unless it is in good healthy condition. No person shall sell or expose for sale any such calf or carcass of the same or any part thereof, except the hide, unless it was, if killed, at least four weeks of age at the time of killing. No person or persons shall bring or cause to be brought into any city, town or village any calf or carcass of the same or any part thereof for the purpose of selling, offering or exposing the same for sale, unless it is in a good healthy condition, and no person or persons shall bring any such calf or carcass of the same or any part thereof except the hide into any city, town or village for the purpose of selling, offering or exposing the same for sale, unless the calf is four weeks of age, or, if killed, was four weeks of age at the time of killing, provided, however, that the provisions of this section shall not apply to any calf or carcass of the same or any part thereof, which is slaughtered, sold, offered or exposed for sale, for any other purpose than food. Any person or persons exposing for sale, selling or shipping any calf or carcass of the same will be presumed to be so exposing, selling or shipping the said calf or carcass of the same for food. Any person or persons shipping any calf for the purpose of being raised, if the said calf is under four weeks of age, shall ship it in a crate, unless said calf is accompanied by its dam. Any person shipping calves under four weeks of age for fertilizer purposes must slaughter

Seizure of calves and veal.

the said calves before so shipping. Any person or persons duly authorized by the commissioner of agriculture may examine any calf or veal offered or exposed for sale or kept with any stock of goods apparently exposed for sale, and if such calf is under four weeks of age, or the veal is from a calf killed under four weeks of age, or from a calf in an unhealthy condition when killed, he may seize the same and cause it to be destroyed and disposed of in such manner as to make it impossible to be thereafter used for food.

Penalties.

The penalties and fines provided in section fifty-two of the agricultural law shall apply to violations of this section except that the minimum penalty for violations of this section shall be, for the first violation, one dollar for each calf, and, for the second violation, ten dollars for each calf, and the minimum fine for first offense shall be one dollar and for second offense ten dollars. (*As amended by chapter* 561 *of the Laws of* 1910.)

People v. Bishopp, 106 App. Div. 266, 94 N. Y. Supp. 773, 128 N. Y. St. Rep. 773; People v. Dennis, 114 N. Y. Supp. 7; People v. Sayre (not reported); People v. Wright, 103 App. Div. 218, statute presumptively constitutional; Williams v. Rivenburg, 129 N. Y. Supp. 473.

§ 107. **Shipping veal.** It shall be unlawful for any corporation, partnership, person or persons to ship to or from any part of this state any carcass or carcasses of a calf or calves or any part of such carcass except the hide, unless they shall attach to every carcass or part thereof so shipped, in a conspicuous place, a tag. that shall stay thereon during such transportation, stating the name or names of the person or persons who raised the calf, the name of the shipper, the points of shipping and the destination and the age of the calf.

§ 108. **Receiving veal for shipment by common carriers.** No railroad company, express company, steamboat company or other common carrier, shall carry or receive for transportation any carcass or carcasses of calves, or any part of the same except the hide, unless the said carcass or carcasses or parts thereof shall be tagged as herein provided.

ARTICLE 6

Prevention of Fraud in Sale of Paris Green and Other Substances

Section 140. State manufacturer and the dealer in original packages to file certificate with commissioner of agriculture.
141. Certificate to be given by the commissioner of agriculture to state manufacturer and dealer in original packages.
142. Composition of paris green or analogous products.
143. Paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral and vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof to be analyzed.
144. Definitions.

Statement by manufacturer and dealer.

§ 140. **State manufacturer and the dealer in original packages to file certificate with commissioner of agriculture.** It shall be the duty of each and every manufacturer of paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral or vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof used for the control of insects or fungus diseases or any other purpose within this state, and of every dealer in original packages of paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral or vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof manufactured outside of this state before the said paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral or vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof is offered or exposed for sale or sold within this state, to submit to the commissioner of agriculture a written or printed statement setting forth: first, the brands of paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral or vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof, to be sold, the number of pounds contained in each package in which it is put

Brands.

upon the market for sale, the name or names of the manufacturers and the place of manufacturing the same; second, the statement shall set forth so near as may be the percentages and chemical compositions of all essential substances or ingredients of said insecticides or fungicides or combinations of the same contained in said commodities. All packages of preparations containing arsenic free or in combination shall bear a statement giving in plain print the percentage of arsenious oxide or its equivalent soluble or insoluble in distilled water, and the statement so furnished shall be considered as constituting a guaranty to the purchaser of the contents of every package. Each and every package of paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral or vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof sold, offered or exposed for sale shall bear a label upon which shall be a statement showing all the facts as set forth in the statement filed with the commissioner of agriculture as provided herein and the said commissioner shall designate the size and character of the printing thereon.

Composition.

Statement on package.

Label.

§ 141. **Certificate to be given by the commissioner of agriculture to state manufacturer and dealer in original packages.** Every purchaser of paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral or vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof, in original packages, which is manufactured outside of this state, who intends to sell or expose the same for sale, and every manufacturer of paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral or vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof, within this state shall, after filing the statement above provided for, with the commissioner of agriculture, receive from the said commissioner of agriculture, a certificate stating that he has complied with the foregoing statement, which certificate shall be furnished without any charge therefor; said certificate when furnished shall authorize the party receiving the same to deal in this state in paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral and vegetable oils, sulphate of copper, Bordeaux

Certificate to manufacturers and dealers.

Authority conferred by certificate.

mixture, or any insecticide or fungicide or essential ingredient thereof. Any person who fails to file the statement aforesaid shall not be entitled to such certificate and shall not be entitled to deal in such articles or commodities within this state; nothing in this section shall be construed as applying to retail dealers who are selling only the goods manufactured by any person or persons, firm, association or corporation holding the certificate herein provided for from the commissioner of agriculture.

Certificate necessary.

Retailers.

§ 142. **Composition of paris green or analogous products.** Paris green, or any product analogous to it, when sold, offered or exposed for sale, as such, in this state, shall contain at least fifty per centum of arsenious oxide.

§ 143. **Paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral and vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential *ingredient thereof to be analyzed.** The commissioner of agriculture shall cause to have taken samples of the different brands of paris green, arsenate of lead, sulphur, lime sulphides, miscible combinations of mineral and vegetable oils, sulphate of copper, Bordeaux mixture, or any insecticide or fungicide or essential ingredient thereof, and submit the same to the director of the New York state agricultural experiment station, who shall analyze or cause to be analyzed such samples so delivered to him, and shall report the result of the analysis forthwith to the commissioner of agriculture.

Samples.

Analysis of samples.

§ 144. **Definitions.** The term "insecticide" as used in this article shall include all substances or mixtures of substances intended to be used for destroying, repelling or mitigating any and all insects which may infest vegetation, man or other animal, or be present in any environment whatsoever. The term "fungicide" as used in this article shall include any substance or mixture of substances intended to be used for destroying, repelling or mitigating any or all fungi or fungus diseases affecting any form of vegetation or vegetable products or existing in any environment whatsoever, providing that nothing herein shall be construed as contravening the provisions of the national pure food and drug law.

Insecticide.

Fungicide.

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* So in the original.

ARTICLE 7

Sale and Analysis of Concentrated Commercial Feeding Stuffs

Section 160. Term "concentrated commercial feeding stuffs" defined.
161. Statements to be attached to packages; contents: analysis.
162. Statements to be filed with commissioner of agriture; to be accompanied by sample and affidavit when requested.
163. License fee.
164. Commissioner of agriculture to take samples for analysis; analysis to be made by director of experiment station.
165. Sale of adulterated meal or ground grains.

§ 160. **Term "concentrated commercial feeding stuffs" defined.** Definition. The term "concentrated commercial feeding stuffs" as used in this article, shall include linseed meals, cotton seed meals, pea meals, bean meals, peanut meals, cocoanut meals, gluten meals, gluten feeds, maize feeds, starch feeds, sugar feeds, dried distiller's grains, dried brewer's grains, malt sprouts, except as hereinafter provided, hominy feeds, ceraline feeds, rice meals, dried beet refuse, oat feeds, corn and oat chops, corn and cob meal, ground beef or fish scraps, meat meals, meat and bone meals mixed, dried blood, mixed feeds, clover meals, alfalfa feeds and meals, compounded feeds, condimental stock and poultry foods, proprietary or trade-marked stock and poultry foods, and all other materials of Exceptions. similar nature; but shall not include hays and straws, the whole seeds nor the unmixed meals made directly from the entire grains of wheat, rye, barley, oats, corn, buckwheat and broom corn. Neither shall it include wheat, rye and buckwheat brans or middlings, not mixed with other substances, but sold separately, as distinct articles of commerce, nor pure grains ground together, nor corn meal and wheat bran mixed together, when sold as such by the manufacturer at retail, nor malt sprouts, when sold as such by the maltster at retail, nor wheat bran and middlings mixed together not mixed with any other substances and known in the trade as "mixed feed," nor ground or cracked bone not mixed with any other substance, nor shall it include poultry foods consisting of whole or whole and cracked grains and grit mixed together when all the ingredients may be identified by the naked eye. (*As amended by chapter* 277 *of the Laws of* 1912.)

§ 161. **Statements to be attached to packages; contents; analysis.** **Statement.** No manufacturer, firm, association, corporation or person shall sell, offer or expose for sale or for distribution in this state, any concentrated commercial feeding stuffs used for feeding live stock unless such concentrated commercial feeding stuffs shall be accompanied by or shall have affixed to each and every package in a conspicuous place on the outside thereof, a plainly printed statement which shall certify as follows:

1. The net weight of the contents of the package, except in the case of malt sprouts sold in packages containing uneven weights. **Weight.**

2. The name, brand or trade mark. **Name.**

3. The name and principal address of the manufacturer or person responsible for the placing of the commodity upon the market. **Manufacturer.**

4. Its composition expressed in the following terms: **Composition.**

a. The minimum per centum of crude protein.

b. The minimum per centum of crude fat.

c. The maximum per centum of crude fibre, provided that the per centum of crude fibre may be omitted if it does not exceed five per centum.

d. If a compounded feed, the name of each ingredient contained therein.

e. If artificially colored, the name of the material used for such purpose.

Bulk goods. If any such concentrated commercial feeding stuffs be sold, offered or exposed for sale in bulk, such printed statement shall accompany every car or lot. Any such feeding stuffs purchased in bulk and later sacked or bagged for purposes of sale shall have tags attached giving the information as provided herein before being sold, offered or exposed for sale. Whenever any feeding stuffs are sold at retail in bulk or in packages belonging to the purchaser, the seller upon request of the purchaser shall furnish the said purchaser the information contained in the certified statement provided herein. That portion of the statement required by this section relating to the quality of feeding stuffs shall be known and recognized as the guaranteed analysis. (*As amended by chapter* 314 *of the Laws of* 1911.)

Guaranteed analysis.

§ 162. **Statements to be filed with commissioner of agriculture; to be accompanied by sample and affidavit when requested.** Before any manufacturer, firm, association, corporation or person shall sell, offer or expose for sale in this state any concentrated commercial feeding stuffs, he or they shall, for each and every brand of concentrated commercial feeding stuff, file annually prior of January first of the calendar year in which such commodity is to be sold, offered or exposed for sale with the commissioner of agriculture a certified copy of the statement, with the exception of the net weight of the contents of the package, specified in section one hundred and sixty-one, said certified copy to be accompanied, when the said commissioner shall so request, by a sealed glass jar or bottle containing at least one pound of the feeding stuff to be sold or offered for sale, and the company or person furnishing said sample shall thereupon make affidavit that said sample corresponds to the feeding stuff which it represents, in the per centum of crude protein, crude fat, crude fibre, name of each ingredient contained therein, if a compounded feed, and the name of any artificial coloring material used. (*As amended by chapter* 314 *of the Laws of* 1911.)

Certified statement.

Sample.

Affidavit.

§ 163. **License fee.** Every manufacturer, importer, agent or seller of any concentrated commercial feeding stuffs, shall pay annually prior to January first of the calendar year in which such commodity is to be sold, offered or exposed for sale to the treasurer of the state of New York a license fee of twenty-five dollars for each and every brand to be sold or offered or exposed for sale. Whenever a manufacturer, importer, agent or seller of any concentrated commercial feeding stuffs desires at any time to sell such material and has not complied with the requirements of the statute he shall before selling, offering or exposing the same for sale, comply with the requirements as herein provided.

License fee.

Said treasurer shall in each case at once certify to the commissioner of agriculture the payment of such license fee. Each manufacturer, importer or person who has complied with the provisions of this article shall be entitled to receive a certificate from the commissioner of agriculture setting forth said facts. Such certificate shall expire on the thirty-first day of December of the calendar year in which it was issued, but no such certificate shall be issued for the sale of a brand of concentrated commercial feeding stuff under a brand or trade name which is misleading or deceptive or which tends to mislead or deceive as to the constituents or materials of which it is composed. Any such certificate so issued may be cancelled by the commissioner of agriculture when it is shown that any statement upon which it was issued is false or misleading. Whenever the manufacturer, importer or shipper of concentrated commercial feeding stuffs shall have filed the statement required by section one hundred and sixty-one of this article and paid the license fee as prescribed in this section, no agent or seller of such manufacturer, importer or shipper shall be required to file such statement or pay such fee. (*As amended by chapter* 317 *of the Laws of* 1909.)

Certificate from commissioner.

Expiration of certificate.

Cancellation of certificate.

Exemption from fee.

§ 164. **Commissioner of agriculture to take samples for analysis; analysis to be made by director of experiment station.** The commissioner of agriculture shall at least once in each year transmit to the New York agricultural experiment station for analysis at least one sample to be taken in the manner hereinafter prescribed, of the different concentrated commercial feeding stuffs sold or offered for sale under the provisions of this article. The said commissioner of agriculture or his duly authorized representative in taking samples shall take them in duplicate in the presence of at least one witness, and in the presence of such witness shall seal such samples and shall at the time of taking tender, and if accepted, deliver to the person apparently in charge one of such samples; the other sample the commissioner of agriculture shall cause to be analyzed. The director of said experiment station shall continue to analyze or cause to be analyzed such samples of concentrated commercial feeding stuffs taken under the provisions of this article as shall be submitted to him for that purpose

Sample for analysis.

Taking of of sample.

Analysis sample.

by the commissioner of agriculture and shall report such analyses to the commissioner of agriculture, and for this purpose the New York agricultural experiment station may continue to employ chemists and incur such expenses as may be necessary to comply with the requirements of this article. The result of the analysis of the sample or samples so procured, together with such additional information as circumstances advise, shall be published in reports or bulletins from time to time.

Chemists.

Publication of result.

§ 165. **Sale of adulterated meal or ground grains.** No person shall adulterate any kind of meal or ground grain or other cattle food with milling or manufacturing offals, or any substance whatever, for the purpose of sale, unless the true composition, mixture or adulteration thereof is plainly marked or indicated upon the package containing the same or in which it is offered for sale; no person shall sell or offer for sale any meal or ground grain or other cattle food which has been so adulterated unless the true composition, mixture or adulteration is plainly marked or indicated upon the package containing the same, or in which it is offered for sale. (*As amended by chapter* 317 *of the Laws of* 1909.)

Labeling adulterated feed.

ARTICLE 8

Sale, Adulteration or Misbranding of Food and Food Products

Section 200. Prohibition as to adulterated or misbranded food.
201. Definition of adulterated or misbranded food.

§ 200. **Prohibition as to adulterated or misbranded food.** No person or persons, firm, association or corporation shall within this state, manufacture, produce, sell, offer or expose for sale or serve in any hotel, restaurant, eating house or other place of public entertainment any article of food which is adulterated or misbranded within the meaning of this article. The term "food" as used herein shall include all articles used for food, confectionery or condiments by man, whether simple, mixed or compound. (*As amended by chapter* 494 *of the Laws of* 1914.) Food.

§ 201. **Definition of adulterated or misbranded food.** In the case of confectionery, an article shall be deemed to be adulterated if it contains terra alba, barytes, talc, chrome yellow, or other mineral substances or poisonous colors or flavors, or other ingredients deleterious or detrimental to health. In the case of food an article shall be deemed to be adulterated: Adulterated confectionery. Adulterated food.

1. If any substance or substances has or have been mixed or packed with it so as to reduce or lower or injuriously affect its quality or strength, so that such product, when offered for sale, shall deceive or tend to deceive the purchaser. Quality or strength.

2. If any substance or substances has or have been substituted wholly or in part for the article, so that the product, when sold or offered for sale, shall deceive or tend to deceive the purchaser. Substitution.

3. If any valuable constituent of the article has been wholly or in part abstracted, so that the product, when sold or offered for sale, shall deceive or tend to deceive the purchaser. Abstraction.

4. If it contains any added poisonous ingredient or any ingredient which may render such article injurious to the health of the person consuming it. Injurious ingredient.

5. If it consists in whole or in part of a filthy, decomposed or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died other than by slaughter. Unfit for food.

6. If it contains methyl or wood alcohol, in any of its forms, or any methylated preparation made from it. Alcohol.

Misbranded food. An article of food shall be deemed to be misbranded:

Imitation. 1. If it be an imitation of or offered for sale under the distinctive name of another article.

Concealment. 2. If it be mixed, colored, powdered or stained in a manner whereby damage or inferiority is concealed, so that such product when sold or offered for sale, shall deceive or tend to deceive the purchaser.

False statement. 3. If the package containing it or its label shall bear any statement regarding the ingredients or the substances contained therein, which statement shall be false or misleading in any particular, or if the same is falsely branded as to the state or territory in which it is manufactured or produced or if it shall be contained in, or served in or from any bottle or receptacle falsely marked, labeled or branded as to the name of the person, persons or corporations manufacturing the same; provided, that an article of Exceptions. food which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded in the following cases:

First. In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food, under their own distinctive names and not included in definition first or third of misbranded articles of food in this section.

Second. In the case of articles labeled, branded or tagged so as to plainly indicate that they are mixtures, compounds, combinations, imitations or blends: provided, that the same shall be labeled, branded or tagged so as to show the character and constituents thereof: and provided further, that nothing in this article shall be construed as requiring or compelling proprietors or manufacturers of proprietary foods which contain no unwholesome added ingredients to disclose their trade formulas, except in so far as the provisions of this article may require to secure freedom from adulteration or imitation. (*As amended by chapter* 494 *of the Laws of* 1914.)

People v. Butler, Inc., 148 App. Div. 928; affd., 212 N. Y. 613; Leahy v. Essex Co., 164 App. Div. 903, 148 N. Y. Supp. 1063.

ARTICLE 9

Sale and Analysis of Commercial Fertilizers

Section 220. Statements to be attached to packages.
221. Deficiency from guaranteed analysis, under certain conditions, not to be considered as violations.
222. Statement filed with commissioner of agriculture; license fees.
223. Presence of inert nitrogenous matter to be stated.
224. Commissioner of agriculture to take samples for analysis; analysis to be made by director of experiment station.

§ 220. **Statements to be attached to packages.** No manufacturer, firm, association, corporation or person shall sell, offer or expose for sale in this state any commercial fertilizer or any material to be used as a fertilizer, the selling price of which exceeds five dollars per ton, unless such commercial fertilizer or material to be used as a fertilizer shall be accompanied by or shall have affixed to each and every package in a conspicuous place on the outside thereof, a plainly printed statement which shall certify as follows: **Statement.**

1. The number of pounds in the package. **Quantity.**

2. The name, brand or trade mark under which it is to be sold, and in the case of agricultural lime its particular form and in the case of nitrogen the source from which derived. **Name.**

3. The name and principal address of the manufacturer or person responsible for the placing of the commodity upon the market. **Manufacturer.**

4. The minimum per centum of each of the following constituents which may be contained therein: **Composition.**

(a) Nitrogen.

(b) Available phosphoric acid, except that in cases of undissolved bone, basic slag phosphate, wood ashes, untreated phosphate rock, garbage tankage and pulverized natural manures, the minimum per centum of total phosphoric acid may be substituted therefor.

(c) Potash soluble in distilled water.

(d) In the case of agricultural lime, the minimum per centum of calcium oxide. If any commercial fertilizer or material to be used as a fertilizer, the selling price of which exceeds five dollars per ton, be sold, offered or exposed for sale in bulk such printed statement shall accompany every lot and parcel so sold, offered or exposed for sale. That portion of the statement required by this section, relating to the quality of commercial fertilizer or material to be used as a fertilizer, shall be known and recognized as the guaranteed analysis. (*As amended by chapter* 72 *of the Laws of* 1915.)

§ 221. **Deficiency from guaranteed analysis, under certain conditions, not to be considered as violations.** It shall be a violation of the provisions of this article if the statement required by section two hundred and twenty of this article shall be false in regard to the number of pounds of fertilizer in the package sold, offered or exposed for sale, or in the name, brand or trade mark under which the fertilizer is sold, or in the name and address of the manufacturer of the fertilizer. It shall also be a violation of the provisions of this article if any commercial fertilizer or material to be used as a fertilizer shall contain a smaller percentage of nitrogen, phosphoric acid, potash or calcium oxide than is certified in said statement to be contained therein, when such deficiency shall be greater than ten per centum of any one of such constituents unless there be a monetary equivalent in excesses in other guaranteed constituents as provided herein; provided such deficiency does not exceed twenty per centum of such guarantee in any one constituent. The basis of values of such constituents necessary in making such computations shall be determined by the commissioner of agriculture. (*As amended by chapter* 435 *of the Laws of* 1910.)

False statement.

Margin of deficiency.

Basis of values.

§ 222. **Statement filed with commissioner of agriculture; license fees.** Before any manufacturer, firm, association, corporation or person shall sell, offer or expose for sale in this state any commercial fertilizer or material to be used as a fertilizer, the selling price of which exceeds five dollars per ton, he or they shall, for each and every brand of commercial fertilizer or material to

Filing of statement.

be used as a fertilizer, file annually, prior to January first of the calendar year, in which such commodity is to be sold, offered or exposed for sale, with the commissioner of agriculture a certified copy of the statement prescribed in section two hundred and twenty of this article. Every manufacturer, firm, association, corporation or seller of any commercial fertilizer or material to be used as a fertilizer the selling price of which exceeds five dollars per ton, shall pay annually prior to January first of the calendar year in which such commodity is to be sold, offered or exposed for sale, to the treasurer of the state of New York a license fee of twenty dollars for each and every brand to be sold or offered or exposed for sale. Whenever a manufacturer, firm, association, corporation or seller of any commercial fertilizer or material to be used as a fertilizer, the selling price of which exceeds five dollars per ton, desires at any time to sell such commercial fertilizer or such material and has not complied with the requirements of the statute, he or they shall before selling, offering or exposing the same for sale, comply with the requirements as herein provided. Said treasurer shall in each case at once certify to the commissioner of agriculture the payment of such license fee. Each manufacturer, firm, association, corporation or seller who has complied with the provisions of this article shall be entitled to receive a certificate from the commissioner of agriculture setting forth said facts. Such certificate shall expire on the thirty-first day of December of the calendar year for which it was issued. Whenever a manufacturer, firm, association, corporation or person shall have filed the statement and paid the license fee as prescribed in this section, upon any given brand, no agent or seller of such manufacturer, firm, association, corporation or person shall be required to file such statement or pay such fee upon said brand. For the purposes of this article, commercial fertilizers or materials to be used as a fertilizer, shall be considered as distinct and separate brands when differing either in guaranteed analysis, name, brand or trade mark or in any other method of marking. (*As amended by chapter* 435 *of the Laws of* 1910.)

Payment of license fee.

Certificate from commissioner.

Exemption from license fee.

Separate brands.

§ 223. **Presence of inert nitrogenous matter to be stated.** No manufacturer, firm, association, corporation or person shall sell, offer or expose for sale in this state leather or its products or other inert nitrogenous material in any form, as a commercial fertilizer or material to be used as a fertilizer or as an ingredient of any fertilizer, unless an explicit statement of the facts shall be affixed to every package in a conspicuous place on the outside thereof and shall accompany every parcel or lot which may be sold, offered or exposed for sale in bulk. (*As amended by chapter* 435 *of the Laws of* 1910.)

§ 224. **Commissioner of agriculture to take samples for anaylsis; analysis to be made by director of experiment station.**

Transmission of sample.

The commissioner of agriculture shall at least once in each year transmit to the New York agricultural experiment station for analysis at least one sample, to be taken in the manner hereinafter prescribed, of the different brands of commercial fertilizers and materials to be used as fertilizers the selling price of which exceed* five dollars per ton, which are or may be sold, offered or exposed for sale under the provisions of this article.

Taking of sample.

The said commissioner of agriculture or his duly authorized representatives in taking samples shall take them in triplicate in the presence of at least one witness and in the presence of such witness shall seal such samples and shall at the time of taking tender, and if accepted, deliver to the person apparently in charge one of such samples, one of the other samples the commissioner of agriculture shall cause to be analyzed. When samples are taken from fertilizers in bags, a tube shall be used and it shall be inserted at one end of the bag and shall pass substantially the entire length of the bag, so as to take a core of the material being sampled from substantially the entire length of the bag. Samples thus taken from individual bags shall be thoroughly mixed and the official samples be taken from the mixture so drawn. Samples of fertilizer taken as herein provided shall be taken from at least five per centum of the separate original packages in the lot for the mixture from which the official samples shall be taken. No action shall be maintained for a violation of the provisions of this article based upon an analysis of samples taken otherwise than as herein provided or taken from less than five separate original packages. The director of said experiment station shall continue to analyze or cause to be analyzed such samples of commercial fertilizers and materials to be used as fertilizers taken under the provisions of this article as shall be submitted to him for that purpose by the commissioner of agriculture and shall report such analysis to the commissioner of agriculture and for this purpose the New York agricultural experiment station may continue to employ chemists and incur such expenses as may be necessary to comply with the requirements of this article. The result of the analysis of the sample or samples so procured, together with such additional information as circumstances advise, shall be published in reports or bulletins from time to time. (*As amended by chapter* 435 *of the Laws of* 1910.)

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* So in the original.

Report of analysis.

Chemists.

Publication of result.

ARTICLE 10

Turpentine, Linseed or Flaxseed Oil

Section 240. Adulteration and sale; notification of purchaser; package and invoices to be marked.
241. Violation a misdemeanor; fine.
242. Powers and duties of commissioner of agriculture.
243. Penalty; action to recover.

Turpentine.

§ 240. **Adulteration and sale; notification of purchaser; package and invoices to be marked.** No person, firm or corporation shall manufacture, mix for sale, sell or offer for sale under the name of turpentine, spirits of turpentine, or wood turpentine or any compounding of the word turpentine, or under any name or device illustrating or suggesting turpentine or spirits of turpentine, any article which is not wholly distilled or derived from resin, crude turpentine gum, or scrapings from pine trees, and unmixed and unadulterated with oil, benzine or any other substance of any kind whatever, unless the package containing the same shall be stenciled or marked, with legible black letters in the English language not less than two inches high and one inch in width, "adulterated spirits of turpentine." Nor shall any person, firm or corporation sell or deliver such adulterated spirits of turpentine without informing the purchaser at the time of sale that the article is not pure spirits of turpentine, and the invoice shall accordingly read, "adulterated spirits of turpentine." Every container in which such mixed or adulterated spirits of turpentine is contained shall, in addition to the labeling before mentioned, be marked or stenciled in legible black letters in the English language, with the percentage of adulterant or adulterants which are contained in such mixture.

Labeling adulterated turpentine.

Linseed oil.

No person, firm or corporation shall manufacture or mix for sale, offer or expose for sale, or sell under the name of raw linseed oil, or any compounding of the name raw linseed oil, or under any name or device illustrating or suggesting raw linseed oil, any article which is not wholly the product of commercially pure linseed or flaxseed.

Nor shall any person, firm or corporation manufacture or mix for sale, offer or expose for sale, or sell under the name of boiled linseed oil, any article unless the oil from which said article is made be wholly the product of commercially pure linseed or flaxseed, and unless the same has been heated to at least two hundred and twenty-five degrees Fahrenheit. Nor shall any person, firm or corporation sell such adulterated linseed oil, unless the package be plainly marked in legible black letters, two inches high and one inch in width, "adulterated linseed oil," or without informing the purchaser at the time of sale, that same is not pure raw linseed, boiled linseed or flaxseed oil, and the invoice shall accordingly read "adulterated linseed oil." **Labeling adulterated linseed oil.**

Nor shall any person, firm or corporation engage in the sale of such adulterated turpentine, linseed or flaxseed oil, in original packages or other than original package, unless there are posted conspicuously in the room where such goods are sold, signs bearing the words "adulterated turpentine," or "adulterated linseed or flaxseed oil, sold here," in legible letters in the English language at least two inches in length and one inch in width, letters to be in black on white background. Nothing herein contained shall be construed as prohibiting the manufacture or sale of any such compound or imitation providing the container shall be plainly marked, and the purchaser notified and the invoice reading accordingly and the requirements of this section otherwise observed, as aforesaid. (*As amended by chapter* 816 *of the Laws of* 1911.) **Notice to purchaser.** **Sale of imitations.**

§ 241. **Violation a misdemeanor; fine.** Violation of any of the provisions of this article shall be a misdemeanor, punishable by a fine of not less than fifty dollars or more than five hundred dollars or by imprisonment for not more than one year, or by both such fine and imprisonment.

§ 242. **Powers and duties of commissioner of agriculture.** It shall be the duty of the commissioner of agriculture to enforce the provisions of this article. The said commissioner and his assistants, experts and chemists, and official agents appointed by him, shall have access, ingress and egress to and from all places of business and buildings, freight platforms, transportation boats, and all wagons and vehicles where turpentine or linseed or flaxseed oil is kept for sale or stored or in transit. They shall have **Enforcement of law.** **Access to buildings, etc.** **Inspection.**

power and authority to open any tank, barrel, can or other vessel containing or supposed to contain turpentine or linseed or flaxseed oil and inspect the contents thereof, and take samples therefrom for analysis. (*As amended by chapter* 816 *of the Laws of* 1911.)

Penalty.

§ 243. **Penalty; action to recover.** Any person, firm or corporation who shall violate any of the provisions of this article shall, in addition to the fine or imprisonment previously described, for each offense forfeit and pay a fixed penalty of one hundred dollars. Such penalty shall be recovered, with costs, in any court of the state having jurisdiction thereof, in an action to be prosecuted in the name of the people, by the commissioner of agriculture.

Action to recover.

ARTICLE 11.

Apples; Fruit-Bearing Trees.

Section 260. *Evaporated apples.
261. *Moisture in evaporated apples.
262. Standard grades or classes for apples.
263. Sale of fruit-bearing trees.
264. Damages accruing from sale of trees.
265. Agent to carry certificate of authority.

§ 260. **Sale of other than standard evaporated apples.** No person shall buy for resale, sell, expose or offer for sale as and for evaporated apples any evaporated apples intended to be used for food, or for consumption by any person, other than standard evaporated apples.

§ 261. **Definition of standard evaporated apples.** Evaporated apples containing not more than twenty-seven per centum of water or fluids as determined by drying for four hours at the temperature of boiling water shall be considered standard evaporated apples for the purposes of this article.

§ 262. **That the standard grades or classes for apples grown in this state when packed in closed packages shall be as follows:**

"New York standard fancy grade."

First: "New York standard fancy grade" shall consist of apples of one variety, which are well grown specimens, hand-picked, properly packed, of good color for the variety, normal shape, free from dirt, diseases, insect and fungus injury, bruises and other defects except such as are necessarily caused in the operation of packing; or apples of one variety which are not more than five per centum below the foregoing specifications on a combination of all defects or two per centum on any single defect.

"New York standard A grade."

Second: "New York standard A grade" shall consist of apples of one variety which are well grown specimens, hand-picked, properly packed, normal shape, practically free from dirt, diseases, insect and fungus injury, bruises and other defects except such as are necessarily caused in the operation of packing; or apples of one variety which are not more than ten per centum below the foregoing specifications on a combination of all defects or five per centum on any single defect. No apples in this grade shall show less than thirty-three and one-third per centum of good color for the variety.

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* So in the original.

"New York standard B grade."

Third: "New York standard B grade" shall consist of apples of one variety which are well matured, hand-picked, properly packed, practically normal shape, practically free from dirt, diseases, insect and fungus injury; or apples of one variety which are not more than fifteen per centum below the foregoing specifications on a combination of all defects or five per centum on any single defect.

Ungraded.

Fourth: "Ungraded." Apples not conforming to the foregoing specifications of grade, or, if conforming, are not branded in accordance therewith, shall be classed as ungraded and so branded. The minimum size of the fruit in the package shall also be branded upon it as hereinafter specified and in addition to the other marks hereinafter required.

Other designation.

The marks indicating grade as above prescribed may be accompanied by any other designation of grade or brand if that designation or brand is not inconsistent with or marked more conspicuously than the one of the said four marks which is used on the said package. Apples packed and branded in accordance with the United States law approved August third, nineteen hundred and twelve, shall be exempt from the provisions of this act.

Exception under U. S. Law.

Minimum size.

The minimum size of the fruit in all classes or grades, including the ungraded, shall be determined by taking the transverse diameter of the smallest fruit in the package at right angles to the stem and blossom end. Minimum sizes shall be stated in variations of one-quarter of an inch, like two inches, two and one-quarter inches, two and one-half inches, two and three-quarter inches, three inches, three and one-quarter inches, and so on, in accordance with the facts.

Designation of size.

Minimum sizes may be designated by figures instead of words. The word "minimum" may be designated by using the abbreviation "min."

Variation.

A tolerance or variation of five per centum on size shall be allowed in all classes, but such five per centum shall not be in addition to the variations or tolerances for defects provided in grades "Fancy," "A" and "B."

(A) Every closed package containing apples grown in the state of New York which is sold, offered or exposed for sale, or packed for sale, or transported for sale by any person shall bear upon the outside of one end in plain letters and figures the name and address of the packer or the person by whose authority the apples were packed and the package marked, the true name of the variety, the grade or class of the apples therein contained and the minimum size of the fruit in the packages. If the true name of the variety shall not be known to the packer or the person by whose authority the package is packed or branded, then such variety shall be designated as "unknown." Every package of apples which is repacked shall bear the name and address of the repacker or the name of the person by whose authority it is repacked in place of that of the original packer.

Branding.

(B) The marks or brands as prescribed by this act shall be in block letters and figures of size of not less than thirty-six point Gothic.

Size and type.

(C) It shall be unlawful for any person within the state to sell, offer or expose for sale, or pack for sale, or transport for sale apples which are adulterated or misbranded within the meaning of this act.

Prohibition.

(D) For the purposes of this act apples packed in a closed package shall be deemed to be misbranded.

Definition of misbranded.

First. If the package shall fail to bear the statements required by this act.

Second. If the package shall be falsely branded or shall bear any statement, design or device regarding such apples which is false or misleading, or if the package bears any statement, design, or device, indicating that the apples contained therein are a given New York "standard grade" and said apples when packed or repacked do not conform to the requirements of such grade.

(E) For the purposes of this act apples packed in closed packages shall be deemed to be adulterated if their quality or grade when packed or repacked does not conform to the marks upon the package.

Definition of adulteration.

(F) Any person who misbrands or adulterates apples within the meaning of this act, or who violates any of the provisions of this act shall, upon conviction thereof, forfeit and pay to the

Penalty.

people of the state of New York a sum of not less than twenty-five dollars nor more than fifty dollars for the first violation and not less than fifty dollars nor more than one hundred dollars for each subsequent violation.

Estoppel.

(G) No person shall be prosecuted under the provisions of this act when he can establish satisfactory evidence to the effect that he was not a party to the packing and grading of such articles and had no knowledge that the same were misbranded or illegally packed, or when he can establish a guaranty, signed by the person from whom he received such articles, to the effect that the same are not adulterated or misbranded within the meaning of this act. Said guaranty, or said satisfactory evidence, to afford protection, shall contain the true name and address of the party or parties from whom said articles were received, or who made the sale or shipment of such articles to such person.

Definitions.

(H) Definitions. The word "person" as used herein shall be construed to include both the singular and plural, individuals, corporations, copartnerships, companies, societies and associations. The act, omission or failure of any officer, agent, servant or employee acting within the scope of his employment or office shall be deemed the act, omission or failure of the principal. The words "closed package" shall mean a box, barrel or other package, the contents of which cannot be seen or inspected when such package is closed.

Act of agent.

(I) No person shall on behalf of any other person pack any apples for sale or transportation contrary to the provisions of this act.

Apples transported to storage.

(J) This act shall not apply to apples actually transported in barrels to storage within this state until the same are sold, offered or exposed for sale, packed for sale, or transported for sale. Regulations and requirements herein in relation to transportation shall not apply to common carriers.

(*As amended by chapter* 217 *of the Laws of* 1915.)

Certificate of inspection.

§ 263. **Sale of fruit-bearing trees.** Every person, firm or corporation selling fruit-bearing trees shipped from any point in the state of New York must have attached to each car, box, bale or package a copy of a certificate of inspection issued by the state department of agriculture and signed by the commissioner of agriculture, valid to the first day of September next following the date of issuance thereof. There shall also be attached to each bundle or package of such fruit-bearing trees a label specifying the name of variety of trees contained therein. In case such bundle or package shall contain trees of different kinds or varieties there must be attached to each tree therein a like label. (*As added by chapter* 367 *of the Laws of* 1914.)

Label.

§ 264. **Damages accruing from sale of trees.** Nothing contained in section two hundred and sixty-three or any other section of this chapter shall be construed to deprive a purchaser of any fruit-bearing tree of his remedy at law in a civil action to recover damages sustained by reason of such trees proving untrue to name as specified on the label. Such damages may be recovered in a civil action by the purchaser of such fruit-bearing trees or by his personal representative or assignee at any time prior to the third bearing year, provided the purchaser notifies the seller as soon as he has reason to believe that such trees are not true to name. In any action to recover damages suffered by the purchaser by reason of any fruit tree or trees not being of the name or variety under which they were tagged and sold, the seller shall have the burden of proof in establishing that any contract or any provision of any such contract exempting the seller from liability or limiting his liability was agreed to by the purchaser. In every case of a sale of fruit-bearing trees in lots of twenty-five or more, the seller must at once furnish the purchaser a copy of such contract upon the face of which shall be plainly printed the following: "In any action to recover damages suffered by the purchaser by reason of any fruit tree or trees not being of the name or variety under which they were tagged and sold, the seller shall have the burden of proof in establishing that any contract or any provision of any such contract exempting the seller from liability or limiting his liability was agreed to by the purchaser." The seller must also accompany the shipment of such trees with an itemized list of the same, which lists* shall also give the name of the county and state where the trees covered by it were grown,

Civil action.

Time limit and notice to seller.

Burden of proof on seller.

Copy of contract with sale.

List of trees must accompany shipment.

Information required on list.

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* So in the original.

the age of the trees, and the name and address of the person for whom the trees were grown, if requested by letter or in writing on the contract by the purchaser at the time of purchase. Within five days after the receipt by the purchaser of the trees and the list thereof the purchaser shall compare and notify the seller of any discrepancy between the list and the labels on such trees. (*As amended by chapter* 127 *of the Laws of* 1915. *Added by chapter* 367 *of the Laws of* 1914.)

Comparison and notification.

Sanford v. Brown Bros. Co., 208 N. Y. 90, 146 App. Div. 916, affd. Wood v. Sherwood, 161 App. Div. 335.

Exhibition of certificate.

§ 265. **Agent to carry certificate of authority.** Any person, firm or corporation acting as agent for another in the sale of fruit-bearing trees in this state shall carry with him, at all times when engaged in selling trees, a certificate in writing signed by his principal and properly acknowledged, showing his authority to act as such agent and upon request shall exhibit the same to the purchaser and shall leave with the purchaser a copy of the contract bearing on its face the clause referred to in section two hundred and sixty-four. (*As added by chapter* 367 *of the Laws of* 1914.)

Agent shall leave copy of contract.

ARTICLE 12

Agricultural Statistics

Section 280. Collection and dissemination of statistics.
281. Information to be furnished by supervisors.

§ 280. **Collection and dissemination of statistics.** The commissioner of agriculture may collect and disseminate such information relative to agriculture, and agricultural labor within the state, as he may deem wise for the purpose of promoting agricultural production within this state.

§ 281. **Information to be furnished by supervisors.** Supervisors of the different towns and wards in this state shall furnish to the commissioner of agriculture upon request from him, upon blanks to be furnished by the said commissioner, such information as may be in their possession or may be obtained by them relative to agriculture, agricultural production and agricultural labor within their respective towns or wards. Such information shall be furnished to said commissioner within thirty days from the time it is asked for. The expense incurred by the several supervisors in furnishing such information shall be a town charge to be paid in the manner now provided by law for the payment of services and disbursements by such supervisors.

Information from supervisors.

Time limit.

Expense.

ARTICLE 12-A.

Sale of Farm Produce on Commission.

Section 282. Definitions.
283. Sale of farm produce on commission; license therefor.
284. Bond.
285. Power of commissioner to investigate.
286. Granting and revoking licenses.
287. Certiorari to review.
288. Report of sale to consignor.
289. Offenses.

Commission merchant.

§ 282. **Definitions as used in this article.** 1. The term commission merchant shall include every person, firm, exchange, association and corporation licensed under this article to receive, sell or offer for sale on commission within this state any kind of farm produce; except where such farm produce is sold for consumption and not for resale. This article shall not apply to the sale of farm produce at public auction by a duly licensed and bonded auctioneer, acting as the agent of another to whom such farm produce shall have been consigned; nor shall this article apply to seeds sold at retail.

Public auction.

Farm produce.

2. The term farm produce shall include all agricultural, horticultural, vegetable and fruit products of the soil, and meats, poultry, eggs, dairy products, nuts and honey, but shall not include timber products, floricultural products, tea or coffee. (*As added by chapter* 457 *of the Laws of* 1913.)

§ 283. **Sale of farm produce on commission; license therefor.** On and after August first, nineteen hundred and thirteen, no person, firm, exchange, association or corporation, shall receive, sell or offer for sale on commission within this state any kind of farm produce, without a license as provided in this article. Every person, firm, exchange, association and corporation in this state receiving farm produce for sale on commission shall, annually on or before June first, file an application with the commissioner of agriculture for a license to do a commission business in farm

Regulations.

Application for license.

produce. Such applicant shall state the kind or kinds of farm produce which the applicant proposes to handle, the full name of the person, firm, exchange, association or corporation applying for such a license and if the applicant be a firm, exchange, corporation or association, the full name of each member of the firm, or the names of the officers of the exchange, association or corporation, and the name of the local agent of the exchange or association and the city, town or village and street number at which the business is to be conducted. Such applicant shall further satisfy the commissioner of agriculture of his or its character, responsibility and good faith in seeking to carry on a commission business. The commissioner of agriculture shall thereupon issue to such applicant, on payment of ten dollars and the execution and delivery of a bond as hereinafter provided, a license entitling the applicant to conduct the business of receiving and selling farm produce on commission at the place named in the application until the first day of July next following. (*As added by chapter* 457 *of the Laws of* 1913.)

Applicant shall state kinds of farm produce.

Name.

Name of local agent.

Address.

Character and responsibility.

License fee.

Bond.

§ 284. **Bond.** Before any such license shall be issued every applicant shall execute and deliver to the commissioner of agriculture a fidelity bond with satisfactory sureties in the sum of three thousand dollars to secure the honest accounting to the consignor of the monies received by such commission merchant from the sale of the farm produce sold on commission, and the commissioner of agriculture may bring an action in any court of competent jurisdiction in the county in which is situated the place of business of the licensee, against the principal and sureties for the recovery of any monies so received and not honestly accounted for. (*As added by chapter* 457 *of the Laws of* 1913.)

Amount.

Action on bond.

County.

§ 285. **Power of the commissioner of agriculture to investigate.** The commissioner of agriculture or his assistants shall have power to investigate, upon the verified complaint of an interested person, the record of any person, firm, exchange, corporation or association applying for a license, or any transaction involving the solicitation, receipt, sale or attempted sale of farm produce on a commission basis, the failure to make proper and

Investigation upon verified complaint.

Failure to account.

true accounts and settlements at prompt and regular intervals, the making of false statements as to condition, quality or quantity of goods received, or while in storage, the making of false statements as to market conditions, with intent to deceive, or the failure to make payment for goods received or other alleged injurious transactions; and for such purpose may examine at the place of business of the licensee, that portion of the ledgers, books of account, memoranda or other documents, relating to the transactions involved, of any commission merchant, and may take testimony therein under oath. When a consignor of farm produce fails to obtain satisfactory settlement in any transaction, after having notified the consignee, a certified complaint may be filed, at the expiration of ten days after such notification, with the commissioner of agriculture. The commissioner of agriculture shall attempt to secure an explanation or adjustment, failing this, within seven days he shall cause a copy thereof, together with a notice of a time and place for a hearing on such complaint, to be served personally, or by mail, upon such commission merchant. Such service shall be made at least seven days before the hearing, which shall be held in the city, village or township in which is situated the place of business of the licensee. At the time and place appointed for such hearing, the commissioner or his assistants shall hear the parties to such complaint, shall have power to administer an oath, and shall enter in the office of the commissioner of agriculture at Albany a decision either dismissing such complaint or specifying the facts which he deems established on such hearing, and in case such facts are established as cause him to revoke such license, he shall bring an action on the bond within sixty days of the filing of such decision. (*As added by chapter* 457 *of the Laws of* 1913.)

False statement.

Examination of documents.

Failure to obtain settlement.

Explanation.

Time.

Service of complaint.

Time.

Hearing.

Decision.

Action.

§ 286. **Granting and revoking licenses.** The commissioner of agriculture may decline to grant a license or may revoke a license already granted where he is satisfied of the existence of the following cases or any of them: 1. Where a money judgment has been entered against such commission merchant and upon which execution has been returned unsatisfied.

Refusal and revocation of license.

Judgment.

2. Where false charges have been imposed for handling or services rendered.

False charges.

3. Where there has been a failure to account promptly and properly or to make settlements, with intent to defraud.

Failure to account.

4. Where there have been false statements as to condition, quality or quantity of goods received or held for sale on commission when the same might be known on reasonable inspection.

False statement as to condition of goods.

5. Where there have been false or misleading statement or statements as to market conditions with intent to deceive.

False statement as to market.

6. Where there has been a combination or combinations to fix prices.

Combinations.

7. Where the commission merchant directly or indirectly purchases the goods for his own account without prior authority therefor or without notifying the consignor thereof. (*As added by chapter* 457 *of the Laws of* 1913.)

Purchase by commission merchant.

§ 287. **Certiorari to review.** The action of the commissioner of agriculture in refusing to grant a license, or in revoking a license granted under this article, shall be subject to review by a writ of certiorari, and if such proceedings are begun, until the final determination of the proceedings and all appeals therefrom, the license of such commission merchant shall be deemed to be in full force and effect, provided the fee for such license shall have been paid and a bond given as herein required. (*As added by chapter* 457 *of the Laws of* 1913.)

License to remain in force during proceeding.

§ 288. **Report of sale to consignor.** Every commission merchant shall, upon the receipt of farm produce and as he handles and disposes of the same, make a record thereof, specifying the name and address of the consignor, the date of receipt, the kind and the quantity of such produce, the amount of goods sold, the selling price thereof and the items of expense connected therewith, and this record together with payment in settlement for said shipment shall be mailed to the consignor within forty-eight hours unless otherwise agreed. (*As added by chapter* 457 *of the Laws of* 1913.)

Keeping of record.

Forwarding to consignor.

§ 289. **Offenses.** Any person, firm, exchange, association or corporation who shall receive or offer to receive, sell or offer to

Dealing without license.
False charges.
Failure to account.
Misdemeanors.
False statement.
Combination.
Purchase by commission merchant.
Miscellaneous.
Misdemeanor.

sell on commission within this state any kind of farm produce without a license except as in this chapter permitted and any person who being a commission merchant in farm produce shall (a) impose false charges for handling or services in connection with farm produce, or (b) fails to account for such farm produce promptly and properly and to make settlements therefor, with intent to defraud, or (c) shall make false or misleading statement or statements as to market conditions with intent to deceive, or (d) enter into any combination or combinations to fix prices, or (e) directly or indirectly purchases for his or its own account, goods received by him or it upon consignment without prior authority therefor from the consignor, or shall fail to promptly notify the consignor of such purchase on his or its own account, or (f) any person handling, shipping or selling farm produce who shall make false statements as to grade, condition, markings, quality or quantity of goods shipped, or packed in any manner, with intent to deceive, shall be guilty of a misdemeanor. (*As added by chapter* 457 *of the Laws of* 1913.)

ARTICLE 13

State Fair

Section 290. Property in town of Geddes, Onondaga county, New York.
291. State fair commission.
292. State fair.
293. Assistants and employees.
294. Receipts and disbursements.

§ 290. **Property in town of Geddes, Onondaga county, New York.** The conveyance to the state by the New York state agricultural society of its property in the town of Geddes, Onondaga county, New York, by deed dated July twenty-eighth, eighteen hundred and ninety-nine, and recorded in the office of the comptroller, is hereby accepted, ratified and confirmed. Such property and any other property hereafter acquired by the state for state fair purposes shall be under the management and control of the state fair commission as hereinafter provided, and they may, from time to time, make rules and provide for the care, preservation and improvement thereof.

Conveyance of property.

Power of commission.

§ 291. **State fair commission.** The state fair commission shall consist of seven members, of whom the president of the senate and the commissioner of agriculture shall ex officio constitute two. The remaining five members of such commission shall be appointed by the governor, by and with the advice and consent of the senate as hereinafter provided. The terms of the five appointive members of such commission in office when this section as hereby amended takes effect shall expire on March first, nineteen hundred and fifteen. On or before March first, nineteen hundred and fifteen, the governor shall, by and with the advice and consent of the senate, appoint five members of such commission to succeed those whose terms expire as hereinabove provided, for terms of one, two, three, four and five years, respectively, so that the term of one member of such commission shall expire on March first of each year. A successor to a member of such commission shall be appointed, in like manner, annually for a full term of

Members of commission.

Appointment.

Presiding officer. Salaries. Expenses.

five years. The president of the senate shall be the presiding officer of the commission. The appointed members of the commission shall receive an annual salary of two thousand dollars, and all the members of such commission shall receive their actual and necessary expenses in the discharge of their official duties. to be paid on the certificate of the commissioner of agriculture and the audit and warrant of the comptroller. (*As amended by chapter* 45 *of the Laws of* 1915.)

Time of holding fair. Racing privileges. Fair rules. Free admission.

§ 292. **State fair.** It shall be the duty of the said commission to hold a state fair at such times as they may deem proper, except that said state fair shall not be held on the first Monday in September, known as Labor day, and between January first and February fifteenth in each calendar year to publish the time of holding said fair in such year. It shall not be lawful for any corporation, association or individual to hold or conduct any trotting or pacing race or races during the week in which the state fair is held, except upon half-mile tracks, and except at the fairs held by agricultural societies which have received moneys from the state, and no corporation, association or individual holding such races during said week shall be entitled to any of the benefits conferred by article twenty of the membership corporations law, or by any general or special law. Such commission may make, alter, suspend or repeal needed rules relating to such fair, including the times and duration thereof, the terms and conditions of entries and admissions, exhibits, sale of privileges, payments of premiums, and any other matters which they may deem proper in connection with such fair. They shall furnish to each person who, on the seventeenth day of January, nineteen hundred. was a life member of the state agricultural society, a free admission to the fair ground during the fair of each year during the life of such member.

§ 293. **Assistants and employees.** The state fair commission may appoint such assistants and employees as they may deem necessary. They may prescribe their duties and fix their compensation. Such assistants and employees shall be subject to removal at the pleasure of such commission. (*As amended by chapter* 366 *of the Laws of* 1910.)

§ 294. **Receipts and disbursements.** The commission shall receive all moneys payable to the state on account of said fair, and make all disbursements therefrom and also from any appropriation made for that purpose by the legislature as may be needed, from time to time, in carrying on the work of the commission. The provisions of section thirty-seven of the state finance law requiring that money received for or on behalf of the state shall be paid monthly into the state treasury shall not apply to the state fair commission, and such commission may pay from the race and other entry fees, gate admissions and other receipts of such fair such expenses as shall be necessary for the proper conduct of the fair and the purposes of the commission. On or before the first day of January of each year the commission shall pay to the state treasurer any balance remaining in their hands received in connection with the state fair, and at the same time file with the comptroller an itemized verified report showing all receipts and disbursements for state fair purposes since the last report, together with the vouchers therefor approved by said commission.

Receipts.

Disbursements.

Financial report.

ARTICLE 14

Miscellaneous Provisions

Section 300. The prevention of disease among bees.
301. Defining honey.
302. Relative to selling a commodity in imitation or semblance of honey.
303. Duties of the commissioner.
304. The prevention of disease in trees, shrubs, plants and vines and the extirpation of insect pests that infest the same.
305. Action to be taken by the commissioner of agriculture relative to trees or other plants affected with or by contagious or infectious disease or fungous growth or infested with insect pest or pests and providing for issuing certificates relative to trees or other plants apparently free from such diseases and pests, regulating the use thereof, defining nursery stock, providing for fumigation. forbidding the bringing into the state such diseases or pests.
306. The New York agricultural experiment station.
307. The director of the New York agricultural experiment station to publish bulletins.
307-a. Additional copies of reports of experiment station.
308. The state weather bureau.
309. Institutions designated to receive United States moneys.
310. Receipt and apportionment of moneys for the promotion of agriculture.
311. Distribution of moneys appropriated for certain agricultural societies.
312. Annual report to the commissioner of agriculture and state society.
313. Lease of grounds of agricultural societies and corporations.
314. Manufacture and sale of imitation maple sugar and syrup prohibited.

Section 315. Branding and labeling of maple sugar and syrup mixtures.
316. Association of farmers; powers of.
317. County judge may appoint policemen or constables.
318. Registration of rural residences.
319. Bureau of supervision of co-operative associations.
320. The governor to direct a temporary loan to prevent or control diseases or insect pests of plant or domestic animal life.

Foul brood. Black brood.

§ 300. **The prevention of disease among bees.** No person shall keep in his apiary any colony of bees affected with a contagious malady known as foul brood or black brood; and every beekeeper when he becomes aware of the existence of either of such diseases among his bees, shall immediately notify the commissioner of agriculture of the existence of such disease.

Honey.

§ 301. **Defining honey.** The terms "honey," "liquid or extracted honey," "strained honey," or "pure honey," as used in this article, shall mean the nectar of flowers that has been transformed by, and is the natural product of the honey-bee, taken from the honeycomb and marketed in a liquid, candied or granulated condition.

Imitation honey. Adulterated honey. Labeling imitation honey.

§ 302. **Relative to selling a commodity in imitation or semblance of honey.** No person or persons shall sell, keep for sale, expose or offer for sale, any article or product in imitation or semblance of honey branded as "honey," "liquid or extracted honey," "strained honey" or "pure honey" which is not pure honey. No person or persons, firm, association, company or corporation, shall manufacture, sell, expose or offer for sale, any compound or mixture branded or labeled as and for honey which shall be made up of honey mixed with any other substance or ingredient. There may be printed on the package containing such compound or mixture a statement giving the ingredients of which it is made; if honey is one of such ingredients it shall be so stated in the same size type as are the other ingredients, but it shall not be sold, exposed for sale, or offered for sale as honey; nor shall such compound or mixture be branded or labeled with the word "honey" in any form other than as herein provided; nor shall any product in semblance of honey, whether a mixture or not, be sold, exposed or offered for sale as honey, or branded or labeled with the word "honey," unless such article is pure honey.

§ 303. **Duties of the commissioner.** The commissioner of agriculture shall immediately upon receiving notice of the existence of foul brood or black brood among the bees in any locality, send some competent person or persons to examine the apiary or apiaries reported to him as being affected, and all the other apiaries in the immediate locality of the apiary or apiaries so reported; if foul brood or black brood is found to exist in them, the person or persons so sent by the commissioner of agriculture shall give the owners or caretakers of the diseased apiary or apiaries full instructions how to treat said cases. The commissioner of agriculture shall cause said apiary or apiaries to be visited from time to time as he may deem best and if, after proper treatment, the said bees shall not be cured of the diseases known as foul brood or black brood then he may cause the same to be destroyed in such manner as may be necessary to prevent the spread of the said diseases. For the purpose of enforcing this article, the commissioner of agriculture, his agents, employees, appointees or counsel, shall have access, ingress and egress to all places where bees or honey or appliances used in apiaries may be, which it is believed are in any way affected with the said disease of foul brood or black brood or where it is believed any commodity is offered or exposed for sale in violation of the provisions of this article. No owner or caretaker of a diseased apiary, honey or appliances shall sell, barter or give away any bees, honey or appliances from said diseased apiary, which shall expose other bees to the danger of said diseases, nor refuse to allow the said commissioner of agriculture, or the person or persons appointed by him to inspect said apiary, honey or appliances, and do such things as the said commissioner of agriculture or the person or persons appointed by him shall deem necessary for the eradication of said diseases. Any person who disregards or violates any of the provisions of this section is guilty of a misdemeanor and shall

Examination of apiaries.

Instruction.

Destruction of bees.

Access.

Exposure prohibited.

Refusal.

Penalties.

be punished by a fine of not less than thirty dollars nor more than one hundred dollars, or by imprisonment in the county jail for not less than one month nor more than two months, or by both fine and imprisonment.

§ 304. **The prevention of disease in trees, shrubs, plants and vines and the extirpation of insect pests that infest the same.** No person shall knowingly or willfully keep any plum, peach, almond, apricot, nectarine or other trees affected with the contagious disease known as yellows. No person shall knowingly or willfully keep any peach tree affected with the disease known as little peach. Nor shall any person knowingly or willfully keep any trees, plants or vines affected or infected with the contagious disease or fungus known as black knot or with any other dangerously injurious fungous growth or any tree, shrub, plant or vine infested or infected with or by the San Jose scale or other insect pest or fungous disease dangerously injurious to or destructive of the trees, shrubs or other plants; every such tree, shrub, plant or vine shall be a public nuisance, and as such shall be abated and no damage shall be awarded for entering upon premises upon which there are trees, shrubs, plants or vines which may be infected with yellows, little peach or black knot or infested with San Jose scale or other insect pest, for the purpose of legally inspecting the same, nor shall any damage be awarded for the destruction by the commissioner of agriculture or his duly authorized agents, or representatives of such trees, shrubs, plants or vines if necessary or proper to suppress such disease or pest, if done in accordance with the provisions of this article, except as otherwise herein provided. Every person, when he becomes aware of the existence of such disease, fungous growth or insect pest in any tree, shrub, plant or vine, owned by him, shall forthwith report the same to the commissioner of agriculture at Albany, New York, and the said commissioner shall take such action as the law provides. If in the judgment of said commissioner of agriculture or the person or persons representing him, the trees, shrubs, plants, vines or their products, boxes, containers, or packing material so infected, infested or diseased should be destroyed or there is reasonable ground to believe that such trees, shrubs, plants, vines or

Yellows.

Little peach.

Black knot.

Other growth.

San Jose scale.

Other disease.

No damage awarded.

Report of existence of infested stock.

Destruction of infested stock.

their products, containers or packing material are or may be so infected, infested or diseased that they should be destroyed, then such destruction shall be carried on and completed under the supervision of the commissioner of agriculture or the person or persons duly appointed by him and authorized so to do, without unnecessary delay, but the owner of the trees, shrubs, plants, vines or their products, boxes, containers or packing material shall be notified immediately upon its being determined that such trees, shrubs, plants, vines or their products, boxes, containers or packing material should be destroyed, by a notice in writing signed by said commissioner or the person or persons representing him, which said notice in writing shall be delivered in person to the owner of such trees, shrubs, plants, vines or their products, containers or packing material or left at the usual place of residence of such owner, or if such owner be not a resident of the town, by leaving such notice with the person in charge of the premises, trees, shrubs, plants, vines or their products, boxes, containers or packing material or in whose possession they may be; such notice shall contain a brief statement of the facts found to exist whereby it is deemed necessary or proper to destroy such trees, shrubs, plants, vines or their products, boxes, containers or packing material and shall call attention to the law under which it is proposed to destroy them, and the owner shall within ten days from the date upon which such notice shall have been received, or such shorter time as the commissioner of agriculture may designate, remove and burn all such diseased or infested trees, shrubs, plants, vines or their products, boxes, containers or packing material. If, however, in the judgment of the commissioner of agriculture, any trees, shrubs, plants, vines or their products, boxes, containers or packing material infected with any such disease or infested with dangerously injurious insects or fungous growth can be successfully treated with remedies, he may direct such treatment to be carried out by the owner under the direction of the commissioner's agent or agents; any person refusing or failing to comply with the directions of the commissioner of agriculture or his duly authorized agents in carrying on the work of extirpating dangerously injurious insect pests and fungous or other diseases shall be guilty of a misdemeanor. In case of objections to the

Notice to owners of infested stock.

Delivery of notice.

Statement in notice.

Time limit.

Treatment of infested stock.

Failure to comply.

findings of the inspector or agent of the commissioner of agriculture, an appeal shall be made to the commissioner of agriculture, whose decision shall be final. An appeal must be taken within three days from the service of said notice and shall act as a stay of proceedings until it is heard and decided. When the commissioner of agriculture or the person or persons appointed by him shall determine when any tree or trees, shrubs, plants, vines or their products, boxes, containers or packing material must be treated or destroyed forthwith, he may employ all necessary assistants for that purpose, and such person or persons, agent or agents, employee or employees, may enter upon any or all premises in any city or town necessary for the purposes of such treatment, removal or destruction. The commissioner of agriculture shall ascertain the value of all boxes or containers destroyed and all trees, shrubs, plants, vines or their products destroyed on the ground that there was reasonable cause to believe they were or might be infected, infested or diseased as provided herein by having an agent of the department appraise the same. If the owner thereof is not satisfied with the value as fixed in such appraisal, then two arbitrators shall be appointed, one by the owner and one by the commissioner of agriculture or his duly authorized representative, and the value fixed by such arbitrators shall be final when duly approved by the commissioner of agriculture. But if such arbitrators fail to agree, then each arbitrator shall make a report to the commissioner of agriculture setting forth the values as determined by him and the said commissioner shall thereafter fix a value upon the articles so appraised. If the owner is not satisfied with the value so fixed, he may take an appeal therefrom to the court of claims, which court is hereby authorized to pass upon the questions involved and determine the amount due the said owner. The commissioner of agriculture shall thereafter make to the comptroller of the state of New York a detailed statement in which he shall set forth the boxes and containers thus destroyed and the trees, shrubs, and plants destroyed on the ground of reasonable cause to believe that they were or might have been infected, infested or diseased and the value thereof determined as provided herein. The comptroller shall thereafter draw his warrant on the treasurer for the amount certified by the commissioner of agri-

Appeal to commission.

Assistants for treatment or destruction.

Appraisal of value.

Arbitration of value.

Determination of value.

Appeal to the court of claims.

Statement to comptroller.

Payment.

culture as the value thereof and the treasurer shall pay to the owner or owners of the said boxes, containers, trees, shrubs, plants, vines or their products so destroyed the value thereof from any money in the treasury specifically appropriated therefor. The provisions of this section shall apply to all boxes, containers, trees, shrubs, plants, vines or their products hereafter or heretofore destroyed, except as to such boxes, containers, trees, shrubs, plants, vines or their products as were brought into the state illegally, and such as are known to be infected or infested with such disease, fungous growth or pest. (*As amended by chapter* 798 *of the Laws of* 1911.)

Exceptions.

§ 305. **Action to be taken by the commissioner of agriculture relative to trees or other plants affected with or by contagious or infectious disease or fungous growth or infested with insect pest or pests and providing for issuing certificates relative to trees or other plants apparently free from such diseases and pests, regulating the use thereof, defining nursery stock, providing for fumigation, forbidding the bringing into the state such diseases or pests.** When the commissioner of agriculture knows or has reason to believe that any such disease, fungous growth or insect pest exists, or that there is good reason to believe that it exists, or danger is justly apprehended of its introduction into any town or city in the state, or that any dangerously injurious insect pest or fungous growth exists within this state, and has reason to believe that danger may be justly apprehended from its existence, he shall forthwith send some competent person and such agent or agents as he may deem necessary to assist in extirpating said pest or pests, disease or diseases, and the said commissioner of agriculture is hereby authorized and empowered to take such steps and do whatever may be deemed necessary to so control or prevent the spread or extirpate such pest or pests, disease or diseases. The said commissioner is hereby empowered to issue such orders and notices as he may deem necessary or proper for the purposes herein relative to such diseased nursery stock or relative to any trees, shrubs, plants, vines or their products, boxes, containers or packing material concerning which he has reasonable cause to believe are or may be infected or infested with any such

Prevention of pests.

Notices for control.

disease or pest. Any person violating the provisions of any order or notice so issued by him shall be guilty of a misdemeanor. He shall cause an examination to be made at least once each year, prior to September first, of each and every nursery or other place where trees, shrubs, plants or vines, commonly known as nursery stock, are grown for sale, for the purpose of ascertaining whether the trees, shrubs, plants or vines therein kept or propagated for sale are infected with any such contagious disease or diseases or infested with such pest or pests. If after such examination it is found that the said trees, shrubs, plants or vines so examined are free in all respects from any such contagious or infectious disease or diseases, dangerously injurious pest or pests, the said commissioner or his duly authorized agent or other person designated to make such examination shall thereupon issue to the owner or proprietor of the said stock thus examined a certificate setting forth the fact that the stock so examined is apparently free from any and all such disease or diseases, pest or pests. Should any nurseryman, agent, dealer or broker, distribute or deliver within the state, trees, vines, shrubs, plants, buds or cuttings, commonly known as nursery stock, and which are subject to the attacks of insects and diseases above provided for, unless he has in his possession a copy of said certificate, dated within a year thereof, deface or destroy such certificate, or wrongfully be in possession of such certificate, he shall be guilty of a misdemeanor. All nursery stock consigned for shipment or shipped by freight, express or other means of transportation shall be accompanied by a copy of said certificate attached to each car, box, bale, bundle or package, but no nursery stock shall be sold or shipped under the certificate issued as provided herein that is not raised in the nursery for or to which the said certificate was issued until such stock has been duly examined as provided herein and found to be apparently free from any dangerously injurious insect pest or disease. Any person consigning for shipment or shipping nursery stock as above without such certificate attached or a facsimile thereof or wrongfully using such certificate or a facsimile thereof shall be guilty of a misdemeanor. All custom house brokers bringing into or causing to be brought into this state any nursery stock shall file with the commissioner of agriculture on or before October first each year the name of the person, firm, association or corpora-

Misdemeanor.

Inspection of nurseries.

Certificate of inspection.

Use of certificates.

Misdemeanor.

Use of certificate.

Misdemeanor.

Information from custom house brokers.

tion engaged in or intending to engage in such business, together with the business address of such person, firm, association or corporation. Notice from transportation companies and custom house brokers. All transportation companies, custom house brokers or other persons importing or bringing nursery stock into this state shall immediately, upon receiving such consignment, notify the commissioner of agriculture of the fact that such consignment is in their possession or is en route to some point within the state and give the name of the consignor and consignee, and the points of shipment and of destination of such consignment, and the name of the transportation company bringing such stock and the route or routes over which it was brought and shall make such further report relative to such shipments as the commissioner of agriculture may from time to time require. Permit to unpack stock from outside state. Any person bringing trees or other plants into this state or receiving such trees or plants from outside the state shall before unpacking the same within the state apply to and receive from the commissioner of agriculture a permit so to do; the commissioner of agriculture shall, upon being satisfied that said trees or plants so desired to be inspected are free from any dangerously injurious insect pest, disease or fungous growth, issue a certificate permitting such person to unpack such trees or plants. Introduction of insect pests. No person shall knowingly or willfully bring into this state or unpack within the state gypsy or brown-tail moth or other insect pests or caterpillar, larvae, pupae or eggs of the same except for scientific purposes and then only upon the written consent and approval of the commissioner of agriculture. Fumigation. All trees, plants, shrubs, buds or cuttings, commonly called nursery stock, grown in any nursery in this state, in which San Jose scale has been found within two years of the date of the dissemination of said nursery stock or grown in said nursery within one-half mile of where said scale was found, must be fumigated with hydrocyanic acid gas, in such manner as may be directed by the commissioner of agriculture of this state. Such fumigation must be done by the grower of such stock before planting, dissemination or reshipment, Exceptions. except such trees, shrubs, plants, buds or cuttings grown in this state as are planted by the grower or propagator for himself, or such as from its nature or state of growth would be exempt; in such cases the said commissioner shall declare such trees, shrubs, plants, buds or cuttings free from such treatment. Should any nursery stock purchased within one year be found infested with San Jose scale on the premises of any nurseryman, it shall not be considered such an infestation as to require the fumigation of other stock not so purchased. The words "nursery stock" wherever used in this article shall apply to and include all trees, shrubs, plants, buds, scions, cuttings and vines grown in a nursery and willows grown for baskets or cuttings or for nursery or other commercial purposes. The provisions of this and the preceding section shall not apply to florists' greenhouse plants, flowers or cuttings commonly known as greenhouse stock, and no certificate shall be required for stock so shipped into the state that its sale and shipment become either interstate commerce traffic or commerce with foreign nations. (*As amended by chapter* 798 *of the Laws of* 1911.)

Nursery stock defined.

Exceptions.

§ 306. **The New York agricultural experiment station.** The institution known as the New York agricultural experiment station, located in the city of Geneva, for the purpose of promoting agriculture in its various branches by scientific investigation and experiment, shall continue under the control and management of a board of trustees. Such board of trustees shall be known as the board of control of the New York agricultural experiment station and shall consist of nine members, except as hereinafter provided. The governor and commissioner of agriculture shall be members of the board by virtue of their offices. The governor shall appoint the other seven members of such board, whose term of office shall be three years, provided, however, that the present members of the board of control shall continue in office until the expiration of the terms to which they were appointed. Such board of control, of which five members shall constitute a quorum, shall hold an annual meeting and such other meetings from time to time as they may deem necessary and shall annually elect a president from their own number, and appoint a secretary and treasurer, to hold their offices during the pleasure of the board. Such board of control shall have general management of the station and shall appoint a director to have oversight and management of the experiments and investigations and other scientific and expert work which shall be deemed necessary to accomplish the objects of said

Location.

Control.

Ex-officio members.

Appointment of board.

Quorum.

Meetings.

Power of board.

Director.

institution, and such board may employ competent and suitable **Chemists, etc.** chemists and other experts and persons necessary for carrying on the work of the station, and shall fix the compensation of all persons connected with the work of said station. Said station shall, besides conducting experiments and investigations for the promotion of agricultural science, perform and report to the commissioner **Analyses.** of agriculture such analyses and other expert scientific work as said commissioner may request as necessary for the administration of the provisions of this chapter and the salaries and other expenses incurred by reason of such analyses and other expert **Salaries and expenses.** scientific service shall be paid from fund provided to said station for the express purpose of aiding in enforcing the provisions of this chapter. Said board of control shall publish or cause to be **Bulletins and reports.** published, from time to time, bulletins and reports giving the results of the experiments and investigations conducted by said station for the promotion of agriculture in its various branches, together with such other information as may promote the pur- **Expenditures.** poses and welfare of said institution. Such board shall have direction of the expenditure of all moneys appropriated to said station; the director shall annually on or before the fifteenth day **Report of director.** of December make a full report to the board of the work accomplished by said station, which report, together with a statement of the receipts and expenditures for the year ending the thirtieth day of September then next preceding, and such other statements as may seem desirable, the board shall transmit to the commissioner of agriculture on or before the first day of January next succeeding, and said report shall constitute part of the annual **Compensation of board.** report of the commissioner of agriculture. No member of said board shall receive any compensation for his services as such, but shall be paid his necessary traveling expenses and those expenses incurred by him by an actual attendance upon the meetings of **Rules and regulations.** such board. The board shall make such rules and regulations as may from time to time become necessary to carry out the objects of the station.

§ 307. **The director of the New York agricultural experiment station to publish bulletins.** The director of the New York agricultural experiment station is hereby authorized and empowered to publish from time to time bulletins giving information as to results of analyses made by him or under his authority or direction at the New York agricultural experiment station, situate in the city of Geneva and state of New York, of any commodity or substance analyzed in pursuance of or under the provisions of the statutes of this state. He may also publish bulletins containing results of analyses made of such substances or commodities, which analyses were made prior to the passage of this section and which have not heretofore been published. Results of analyses.

§ 307-a. **Additional copies of reports of experiment station.** In addition to the number of copies otherwise required by law, the commissioner of agriculture may, with the approval of the governor, cause to be printed by the state printer such number of copies of any report of the New York Agricultural Experiment Station at Geneva, heretofore or hereafter made, as he deems sufficient to meet the public demand therefor as provided by this section. The expense of printing such copies shall be paid for out of the appropriation for the legislative printing, at the prevailing rates, upon the audit of the comptroller. Such copies shall be delivered to the commissioner of agriculture and sold by him to the public at the actual cost thereof as determined by the audit of the comptroller. (*As added by chapter* 458 *of the Laws of* 1913.) Expense of printing. Sale.

§ 308. **The state weather bureau.** The state meteorological bureau and weather service, shall hereafter be known as the state weather bureau, and shall be under the control and management of the commissioner of agriculture. Such commissioner may appoint the director of such bureau but such director shall not receive any compensation for his services. The commissioner may continue the central office and station for meteorological observation and experiment upon the grounds of Cornell university, and shall, if practicable, establish and supervise one or more volunteer weather stations in each congressional district of the state, in co-operation with the chief of the United States weather bureau, for the purpose of increasing the usefulness of the weather service of the state and of the United States. The sum of four thousand Control. Director. Volunteer stations. Appropriations.

five hundred dollars, or so much thereof as the commissioner deems necessary, shall be annually appropriated to be paid to the commissioner by the treasurer, upon the warrant of the comptroller, issued upon the vouchers of the commissioner, for necessary clerical services at such central office, for printing and distributing reports of the results and operations of such bureau, in such manner as shall be most serviceable to the people of the state, and for the purchase, preservation and repair of proper and necessary instruments for the work of such bureau and for the reasonably necessary traveling and incidental expenses of such commissioner and director in the performance of their duties, and for such other expenses as such commissioner shall deem necessary for the efficient administration of such bureau.

§ 309. **Institutions designated to receive United States moneys.** The Cornell university and the agricultural experiment station at Geneva established by the laws of the state are hereby designated as the institutions within this state, entitled to receive such portion as the legislature shall determine of the benefits of the act of the congress of the United States, approved March second, eighteen hundred and eighty-seven, entitled "An act to establish agricultural experiment stations in connection with the colleges established in the several states, under the provisions of an act approved July second, eighteen hundred and sixty-two, and of the acts supplementary thereto." Such benefits of such acts which this state is authorized thereby to apply to any college, institution or agricultural experiment station within this state, are applied to the agricultural experiment station established under the direction of Cornell university and the agricultural experiment station at Geneva, and this state consents that such appropriation, money or benefits to or for the use of this state, or of any institution within this state, payable under or in pursuance of such act of congress, shall be paid nine-tenths thereof to the treasurer of Cornell university, the officer designated to receive the same, and one-tenth thereof to the officers of the agricultural experiment station at Geneva designated to receive the same, to be expended as provided in such act of congress. Such experiment station shall, annually, on or before the first day of December, make, to the commissioner

Agricultural experiment stations.

Division of funds.

Annual report to commissioner.

of agriculture, a full and detailed report of its operations, including a statement of its receipts and expenditures for the year ending with the thirtieth day of September then next preceding. Such experiment station may, with the consent and approval of the commissioner of agriculture, appoint horticultural experts to assist such experiment station, in the fifth judicial department, in conducting investigations and experiments in horticulture; in discovering and remedying the diseases of plants, vines and fruit trees; in ascertaining the best means of fertilizing vineyard, fruit and garden plantations, and of making orchards, vineyards and gardens prolific; in disseminating horticultural knowledge by means of lectures or otherwise; and in preparing and printing, for free distribution, the results of such investigations and experiments, and such other information as may be deemed desirable and profitable in promoting the horticultural interests of the state. Such experts may be removed by such experiment station, in its discretion, and may be paid for their services such sums as it may deem reasonable and proper, and as shall be approved by the commissioner of agriculture. All of such work by such experiment station and by such experts shall be under the general supervision and direction of the commissioner of agriculture. The treasurer of this state shall keep the account of all moneys hereafter received by him in pursuance of such act of congress, in a separate fund, to the credit of the Cornell university and the agricultural experiment station at Geneva, in the proportion stated in this section, and shall pay all such moneys immediately upon receipt thereof by him to the officers respectively designated therein to receive the same, upon the warrant of the comptroller, issued upon the order of the trustees of Cornell university and the board of control of the agricultural experiment station at Geneva, in pursuance of said act of congress, which said moneys are hereby appropriated for the purposes herein stated.

Horticultural experts.

Dissemination of horticultural knowledge.

Salary of experts.

Supervision of commissioner.

Treasurer's account.

Transfer of funds.

§ 310. **Receipt and apportionment of moneys for the promotion of agriculture.** All the moneys already appropriated, or hereafter appropriated, for the promotion of agriculture in any one year, and all the revenues which have been, or shall be received by the comptroller, and all the moneys received by him from the tax collected from racing associations pursuant to article twenty of the membership corporations law, or hereafter otherwise collected from racing associations, corporations or clubs, shall constitute a fund, which shall be annually disbursed on behalf of the state for the promotion of agriculture and domestic arts, for the promotion of education along agricultural lines and for the promotion of the improvement of the breeding of cattle, sheep, horses and other domestic animals at the various fairs throughout the state, and shall be apportioned and distributed as hereinafter prescribed, among all the various county agricultural societies, the American institute of the city of New York, and among the other various town or other agricultural societies, or agricultural fair associations, or agricultural expositions, or agricultural clubs which have received moneys from the state and disbursed moneys for the state for such promotion, during either one of the three years, nineteen hundred and five, nineteen hundred and six, or nineteen hundred and seven, under and by virtue of section eighty-eight or eighty-nine of the agricultural law as it then existed. Such apportionment and distribution shall be made by the commissioner of agriculture in the following manner: Of such moneys already appropriated, or hereafter appropriated, there shall be apportioned and distributed to such county agricultural societies, American institute of the city of New York, and such various town or other agricultural societies, or agricultural clubs, or agricultural fair associations, or agricultural expositions, hereinbefore mentioned, in proportion to the actual premiums paid during the previous year by such agricultural societies, agricultural fair associations, agricultural expositions, agricultural clubs, and the American institute of the city of New York, exclusive of the premiums paid for trials and tests of speed, skill and endurance of man or beast. No such American institute of the city of New York, or such county agricultural society, or such town or other agricultural society, or such agricultural fair association, or such agricultural exposition, or such agricultural club shall receive any more moneys under the provisions of this article in any one year, than it actually paid out in premiums the next preceding year, exclusive of the premiums paid for trials,

Fund.

Distribution.

Basis of distribution.

Limit of distribution.

or tests of speed, skill or endurance of man or beast, and in no event shall any such American institute of the city of New York, or such county agricultural society, or such town or other agricultural society, or such agricultural fair association, or such agricultural exposition, or such agricultural club receive under the provisions of this article, in any one year for premiums hereafter to be paid by any society, association, club or exposition, any sums of money exceeding four thousand dollars. Any such county agricultural society, town or other agricultural society, or agricultural club or fair association, or agricultural exposition, organized under the laws of the state of New York, which shall fail or neglect to hold an annual fair, and file its annual report as provided by this article, with the commissioner of agriculture, as herein provided, for two consecutive years, shall forfeit all of its chartered rights, including any privileges or moneys it might thereafter otherwise be entitled to under the provisions of this article. Except that where the lands or property of any such agricultural society or association have been or may hereafter be taken or appropriated by the state of New York for use in connection with the construction of the barge canal, no such society or association whose lands or property has been or may be so taken or appropriated shall forfeit any of its rights or privileges, or any of the moneys it might otherwise be entitled to under the provisions of this article, unless such society or association shall fail or neglect to hold an annual fair and file its annual report as provided by this article for five consecutive years. All agricultural clubs, societies, agricultural fair associations, agricultural expositions, or the American institute of the city of New York, entitled to receive any portion of the moneys appropriated by the state, must hereafter on or before the fifteenth day of December in each year, file a statement, duly verified by the president and treasurer or secretary, showing the amount of premiums paid at the last annual fair, exclusive of premiums paid for trials or tests of speed, skill or endurance of man or beast, which statement together with vouchers for moneys paid as premiums shall be filed in the office of the commissioner of agriculture, otherwise such society, fair association, exposition, club, or the American institute of the city of New York, shall forfeit its

Failure to hold annual fair.

Exception.

Statement.

rights to participate in the distribution of such moneys for premiums paid for such year. New societies. No other agricultural society, now or hereafter organized which is not entitled to receive moneys under this section, except a county agricultural society, shall be entitled to receive any moneys under the provisions of this article. until it shall have first filed annual reports in the office of the commissioner of agriculture, as hereinbefore provided, and paid in actual cash premiums for agricultural, mechanical and domestic products at least four thousand five hundred dollars for one year or at least fifteen hundred dollars a year for three consecutive years, exclusive of the premiums paid for trials, or tests of speed. skill or endurance of man or beast. When any such other agricultural society has filed such annual reports and paid such premiums for one year or three successive years as herein provided and to the satisfaction of the commissioner of agriculture, then the said commissioner of agriculture may thereafter allow such society to draw moneys under and by virtue of the provisions of this article. Legal status of societies. All such county agricultural societies, town or other agricultural societies, or fair associations, or agricultural expositions organized under the laws of the state of New York which have received moneys from the state for premiums paid for the promotion of agriculture and domestic arts, for the promotion of education along agricultural lines, or for the promotion of the improvement of the breeding of cattle, sheep, horses and other domestic animals, shall be deemed as agents for the state in disbursing such moneys and shall be entitled to be reimbursed for such moneys paid as provided in this article, from an annual appropriation which shall not be less than two hundred and fifty thousand dollars. Any agricultural society, agricultural club or agricultural exposition which shall knowingly permit any immoral, lewd, obscene or Shows and gambling. indecent show or exhibition, use, or knowingly permit the use of, any gambling device, device, instrument or contrivance in the operation of which bets are laid or wagers made, wheel of fortune, or the playing or carrying on of any game of chance, upon the grounds used by it for, or during, an annual meeting, fair or exhibition, shall thereupon forfeit its rights to any moneys it would or might be entitled to receive under the provisions of this article; and it shall be the duty of the president and secretary or treasurer of every agricultural society, agricultural club, or agricultural exposition entitled to receive money under the provisions of this article, to certify, in its annual report to the commissioner of agriculture, executed under oath, on or before the fifteenth day of December, in each year, that at the last annual meeting, fair or exhibition held by or under the direction of such society, club or exposition, it did not knowingly permit any immoral, lewd, obscene or indecent show or exhibition by whatever name known, or use or knowingly permit the use of, any gambling device, device, instrument or contrivance in the operation of which bets were laid, or wagers made, any wheel of fortune, or the playing or carrying on of any game of chance, upon the grounds used by it for, or during such last annual meeting, fair or exhibition, which report shall be filed in the office of the commissioner of agriculture. If the president and secretary or treasurer of any agricultural society, agricultural club or agricultural exposition, entitled to receive moneys under the provisions of this article, shall neglect or refuse to make and file such certificates, such society, club or exposition shall thereupon be deemed to have forfeited all its rights to any moneys it might otherwise be entitled to receive under this article for such year, but this shall not be construed to prohibit horse racing, or tests or trials of skill. (*As amended by chapter* 459 *of the Laws of* 1913.)

Certificate as to gambling, etc.

Failure to file certificate.

§ 311. **Distribution of moneys appropriated for certain agricultural societies.** Of all moneys appropriated in the regular appropriation bill during any one year by the legislature for distribution among the agricultural societies by the commissioner of agriculture, the said commissioner may distribute to the agricultural societies entitled to partake thereof an amount to each one, on or after the first day of October, in the said year, from the moneys due said society not to exceed fifty per centum of the amount of premiums paid by the said society at its annual fair held during said year. Any balance or balances shall be distributed as provided by section three hundred and ten of this chapter.

Balance.

§ 312. **Annual report to the commissioner of agriculture and state society.** The president and treasurer of any agricultural society which receives any money of the state or acts as the agent of the state in the distribution of money of the state as premiums, shall annually before the fifteenth day of December, transmit to the commissioner of agriculture a detailed account of the expenditure or distribution of all such moneys as shall have come into their hands during the preceding year, and of such other moneys as they may have received from voluntary contributions for distribution as premiums, stating to whom, and for what purpose paid, with the vouchers therefor. The presidents of the several county societies and of the American institute shall annually transmit in the month of December, to the executive committee of the New York state agricultural society, all such reports or returns as they are required to demand from applicants, for premiums, together with an abstract of their proceedings during the year, which shall be examined by such executive committee, and they shall condense, arrange and report the same, with a statement of their own proceedings, to the legislature on or before the first day of March in each year.

Account of disposal of moneys.

Report to state agricultural society.

Report to legislature.

§ 313. **Lease of grounds of agricultural societies and corporations.** Any agricultural society or corporation, owning or possessing grounds in a county of this state having a population of more than three hundred thousand and less than six hundred thousand may lease such grounds for any lawful purpose except running races not inconsistent with the use thereof for the purposes of the society or corporation, for such time or times as said grounds may not be needed by any such agricultural society or corporation for its own purposes.

Purpose.

Time.

§ 314. **Manufacture and sale of imitation maple sugar and syrup prohibited.** 1. No person shall manufacture for sale, keep for sale, or offer or expose for sale, any sugar in imitation or semblance of maple sugar which is not pure maple sugar, nor any syrup in imitation or semblance of maple syrup, which is not pure maple syrup, nor shall any person manufacture, offer or expose for sale any sugar as and for maple sugar which is not pure maple sugar, nor any syrup as and for maple syrup which is not pure maple syrup.

Prohibition.

2. For the purpose of this article the term "maple sugar" shall be deemed to mean sugar made from pure maple sap or pure maple syrup, and the term "maple syrup" shall be deemed to mean syrup made from pure maple sap. Terms defined.

People v. Munn, 131 App. Div. 341.

§ 315. **Branding and labeling of maple sugar and syrup mixtures.** No person shall manufacture, sell or expose for sale, any compound or mixture as and for sugar which shall be made up of maple sugar mixed with any other sugar or any other substance without branding or labeling the said sugar with a statement giving the ingredients of which it is made up. No person shall manufacture, sell, expose for sale or offer for sale any compound or mixture as syrup which shall be made up of maple syrup mixed with any other syrup or ingredient without branding or labeling said syrup with a statement giving the ingredients of which it is made up. This shall not be construed to apply to a syrup or syrups manufactured and sold for medicinal purposes only. Sugar. Syrup. Exceptions.

§ 316. **Association of farmers; powers of.** Any association of farmers, residing in any neighborhood, town or county in this state, now, or hereafter to be organized, and acting under a constitution and by-laws adopted by themselves for their guidance, which shall be filed in the clerk's office of such town or county and which are not inconsistent with the laws of this state, is hereby authorized to lease and maintain grounds and structures for the exhibition and sale of the products of their farms or their skill, and for the instruction and recreation of its members and visitors. Any such association shall have authority to let, for rent, locations on their leased grounds to shopmen and persons wishing to furnish suitable refreshments for victualing members and visitors; to license peddlers to sell on their grounds articles of merchandise, not forbidden to be sold by any law of this state without license from the state; and in the name of such association and upon the action and direction of its officers, to sue for and collect the stipulated sums for such rentals and licenses, and to enforce the observance of its rules and regulations by the several members of its association. And such association is hereby empowered to issue certificates of indebtedness in amounts of five dollars each, Maintenance of grounds. Renting. Licensing. Enforcement of rules. Certificate of indebtedness.

providing that the whole amount shall not exceed the sum of one thousand dollars, which they may sell at a price not below the par value thereof, for the purpose of raising money for the erection of buildings, or for such other improvements as may be deemed necessary by a majority of the members of such association.

§ 317. **County judge may appoint policemen or constables.** The county judge of any county in this state wherein such a voluntary association of farmers may exist is hereby authorized, upon the nomination of the presiding officer, or the executive committee of such association, to appoint any number of reputable persons, citizens of such neighborhood, town or county, as special policemen or constables, who shall have authority to preserve the peace at any meeting of such association on its grounds or in the neighborhood thereof; and to protect the property of such association or of any of its members, visitors, lessees or licensees while on such grounds or on the way to or from such grounds. But such special policemen or constables shall have no authority, from such appointment, to act as policemen or constables, other than as herein authorized, except that they may arrest any person committing unlawful depredation on such grounds, or unlawfully injuring persons or property thereon, or on the way to or from such grounds, or otherwise committing breaches of the peace, and may take such persons so offending, when arrested, before some proper magistrate, to be dealt with according to law.

Appointment of officers of peace.

Powers of officers.

§ 318. **Registration of rural residences.** The owner, or owners, if husband and wife, in fee of a parcel of land having a dwelling house thereon and containing over one hundred acres, wholly situate outside of the limits of an incorporated village or city, may cause such premises to be registered under a designation approved by the secretary of state, with which designation may be associated, if desired, a device, likewise approved, by filing in the office of the secretary of state such approved designation with a description of the premises, by metes and bounds, together with a map upon a scale established in said office and paying a fee of ten dollars besides the payment for recording the description and for copying the map, upon the reduced scale, in the book of registration.

§ 319. **Bureau of supervision of co-operative associations.** There is hereby established in the department of agriculture a bureau of supervision of co-operative associations. The bureau shall be in charge of the superintendent who shall be appointed by the commissioner of agriculture. He shall receive an annual salary of three thousand dollars, and all necessary traveling and other expenses incurred in the performance of his duties. The superintendent of co-operative associations shall under the direction of the commissioner of agriculture have general charge of the development of agricultural co-operative associations, for the buying and selling of farm produce throughout the state; shall assist at the organization of such associations at points where they can be developed; shall issue such information as shall be necessary and desirable for the increase of co-operative associations of this class, and shall collect and disseminate through farmers' institutes or otherwise, as the commissioner may direct, information, statistics and other assistance leading to the development of co-operative associations. Such superintendent shall also visit from time to time co-operative associations formed in this state and assist them with aid and advice in the management and conduct of their affairs. He shall report quarterly to the commissioner of agriculture the results of his endeavors and the conditions of co-operative associations within the state. (*As added by chapter* 235 *of the Laws of* 1913.)

Superintendent.

Salary.

Duties.

Visitation.

§ 320. **The governor to direct a temporary loan to prevent or control diseases or insect pests of plant or domestic animal life.** Whenever it shall appear to the satisfaction of the governor of this state that any communicable, infectious, contagious or destructive *disease or diseases or insect pest or pests affecting plant or domestic animal life exists, or that there is great danger of its being brought into this state, and that there is not sufficient money duly appropriated for the prevention, eradication, suppression or control of such disease or diseases or insect pest or pests, he shall direct the state comptroller to make on behalf of the state a temporary loan in the amount not to exceed fifty thousand dollars to be used by the commissioner of agriculture in preventing, eradi-

Authority to borrow

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* So in original.

cating, suppressing or controlling such disease or diseases or insect pest or pests so found to exist or to be imminent. The comptroller shall thereupon borrow such sum for such purpose, and Report to legislature. shall report the transaction, on January first of the year following, to the legislature, with a recommendation that an appropriation be made to repay the sum or sums so borrowed. The provisions of section thirty-five of the state finance law shall not apply to any indebtedness incurred by the comptroller on behalf of the state pursuant to this section. (*As added by chapter* 195 *of the Laws of* 1914.)

ARTICLE XV

Inspection and Sale of Seeds.

Section 340. Inspection and sale of seeds.
341. Samples, publication of results of examination.

§ 340. **Inspection and sale of seeds.** Within the meaning of this article "agricultural seeds" are defined as the seeds of alfalfa, Canadian blue grass, Kentucky blue grass, alsike clover, crimson clover, red clover, white clover, vetch, orchard grass, rape, red top, and timothy which are to be used for sowing or seeding purposes. No person, firm or corporation shall sell, offer, expose or have in his possession for sale for the purpose of seeding, any seeds of grasses or clovers, of the kind known as agricultural seeds containing in excess of three per centum by weight of foul or foreign seeds, unless every receptacle, package, sack or bag containing such seeds is plainly marked or labeled with the per centum of such foul or foreign seeds contained therein. (*As amended by chapter* 59 *of the Laws of* 1914.)

Term defined.

Prohibition

§ 341. **Samples, publication of results of examination.** The commissioner of agriculture or his duly authorized representatives shall take samples of seed in triplicate in the presence of at least one witness and in the presence of such witness shall seal such samples and shall at the time of taking tender, and if accepted, deliver to the person apparently in charge one of such samples; one of the other samples the commissioner of agriculture shall cause to be analyzed. The director of the New York agricultural experiment station shall analyze or cause to be analyzed such samples of seeds taken under the provisions of this article as shall be submitted to him for that purpose by the commissioner of agriculture and shall report such analysis to the commissioner of agriculture, and for this purpose the New York agricultural experiment station may employ experts and incur such expenses as may be necessary to comply with the requirements of this article. The result of the analysis of the sample or samples so procured, together with such additional information as circumstances advise, shall be published in reports or bulletins from time to time. (*As amended by chapter* 297 *of the Laws of* 1912.)

Samples of seed.

Manner of taking.

Analysis.

Report of analyst.

Publication of reports.

*ARTICLE 16

Laws Repealed; When to Take Effect

Section 360. Laws repealed.
361. When to take effect.

§ 360. **Laws repealed.** Of the laws enumerated in the schedule hereto annexed, that portion specified in the last column is hereby repealed. (*As renumbered by chapter* 297 *of the Laws of* 1912.)

§ 361. **When to take effect.** This chapter shall take effect immediately. (*As renumbered by chapter* 297 *of the Laws of* 1912.)

SCHEDULE OF LAWS REPEALED

Laws of	Chapter	Section
1785	68	1–4
1788	54	All
1791	54	4
1792	64	All
1808	187	All
1819	107	All
1820	97	All
1822	236	All
1824	265	All
1841	169	1, 2, 4, 5, 7, 8
1841	340	All
1842	176	All
1844	336	All
1845	60	All
1848	299	1, 2, 4, 5, 7
1854	230	All
1862	293	All
1862	467	All
1864	518	All
1864	544	All
1865	361	All
1865	559	All
1866	740	All

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* Formerly article 15. Renumbered by chapter 297 of the Laws of 1912.

Laws of	Chapter	Section
1867	453	All
1869	167	All
1869	210	All
1869	271	All
1869	563	All
1876	161	All
1877	415	All
1878	134	All
1878	220	All
1878	237	All
1879	306	All
1880	439	All
1880	592	All
1881	300	All
1881	657	All
1881	702	All
1882	214	All
1882	215	All
1882	238	All
1882	246	All
1883	243	1, pt. affecting L. 1879, Ch. 306
1884	202	All
1884	418	All
1884	474	All
1885	183	All
1885	193	All
1885	427	All
1885	458	All
1886	577	All except that part of § 6 designated as L. 1885, Ch. 183, § 24
1886	606	All
1887	155	All
1887	223	All
1887	403	All
1887	430	All
1887	583	1, pt. adding § 27 to L. 1885, Ch. 183; 2–4

Laws of	Chapter	Section
1887	634	All
1888	286	All
1888	298	All
1888	550	All
1889	148	All
1889	515	All
1889	538	All
1891	140	All
1891	354	All
1892	501	All
1893	338	All
1893	364	All
1893	564	All
1893	726	1, pt. constituting fourth ¶ on page 1840
1894	143	All
1894	241	All
1894	376	All
1894	426	1
1894	617	All
1894	640	All
1894	675	All
1895	134	All
1895	587	All
1895	763	All
1895	820	All
1896	221	All
1896	955	All
1897	500	All
1897	554	1
1897	589	All
1897	768	All
1898	113	All
1898	153	All
1898	194	All
1898	412	All
1898	482	All

Laws of	Chapter	Section
1898	491	All
1898	494	All
1898	557	All
1898	558	All
1898	559	All
1899	101	All
1899	149	All
1899	223	All
1899	303	All
1899	435	All
1899	510	All
1899	518	All
1899	687	All
1900	76	All
1900	79	All
1900	87	All
1900	101	All
1900	118	All
1900	339	All
1900	346	All
1900	534	All
1900	544	All
1900	559	All
1901	144	All
1901	224	All
1901	308	All
1901	321	1, 3, 4
1901	375	All
1901	417	All
1901	429	All
1901	656	All
1902	27	All
1902	30	All
1902	31	All
1902	214	All
1902	240	All
1902	263	All

Laws of	Chapter	Section
1902	385	All
1902	519	All
1902	521	All
1903	20	All
1903	142	All
1903	214	All
1903	524	All
1904	27	All
1904	168	All
1904	253	All
1904	391	All
1904	439	All
1904	447	All
1904	480	All
1904	558	All
1904	566	All
1904	567	All
1904	570	All
1904	702	All
1905	100	All
1905	167	All
1905	171	All
1905	243	All
1905	601	All
1905	602	All
1905	603	All
1905	759	All
1906	372	All
1906	584	All
1906	605	All
1907	137	All
1907	178	All
1907	226	All
1907	241	All
1907	281	All
1907	322	All
1907	406	All

Laws of	Chapter	Section
1907........	483........	All
1907........	484........	All
1907........	493........	All
1907........	610........	All
1907........	684........	All
1907........	713........	All
1908........	31........	All
1908........	215........	All
1908........	279........	All
1908........	283........	All
1908........	486........	All
1908........	518........	All
*1909.......	9........	104, 105

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* Repealed by chapter 232 of the Laws of 1909.

EXTRACTS

FROM THE

COUNTY LAW, TOWN LAW, LABOR LAW, AND GENERAL BUSINESS LAW,

AND OTHER

ENACTMENTS OF THE LEGISLATURE WHICH BEAR SOME RELATION TO AGRICULTURE

ARTICLE 7 OF THE COUNTY LAW:

Chapter 16 of the Laws of 1909 being chapter 11 of the Consolidated Laws as amended by the Laws of 1913.

Dogs

Section 110. Tax on dogs.
111. Rate of taxation when not fixed by the board.
112. Owner to deliver description.
113. Tax, how collected.
114. Application of proceeds of tax and other moneys.
115. Collector's fees.
116. When payment of tax to be proved.
117. Liability of owners of dogs for injuries.
118. Duties and powers of fence viewers.
119. Certificate to be evidence.
120. Duties of town board.
121. Tax to pay orders for sheep or angora goats killed.
122. When owners shall refund.
123. Dogs chasing sheep or angora goats to be killed.
124. Owner to kill dog after notice.
125. When justice may order dog killed.
126. Who deemed owner of dog.
127. Penalties, collection and application of.
128. Adoption by county of dog registration provisions.
129. Payment of fees; issue of tags; definition of dog.
130. Duties of assessors.
131. Duty of town clerk.
132. Penalties; actions therefor.
133. Seizure of dogs not tagged or registered.
134. Value to be recovered.
135. Disposition of registration fees and penalties.
136. Actions for injury or destruction of unregistered dogs.

§ 110. **Tax on dogs.** Each board of supervisors, except in counties having a population of eight hundred thousand or over, may fix and impose a tax on dogs within the several cities and towns in its county. The board of supervisors of any such county may fix or impose a tax upon dogs in any town therein at a different rate than that imposed upon dogs in other towns in such county, upon the written application of the town board of such town. Such application shall specify the rate of tax to be imposed in such town. Such taxes shall be assessed, collected and applied in the manner provided by sections one hundred and thirteen and one hundred and fourteen of this chapter. If they do not exercise the powers herein conferred, the following provisions, so far as they relate to the taxation of dogs and the manner of collecting the same, shall apply to such county and the towns therein. The provisions of sections one hundred and ten to one hundred and twenty-seven, both inclusive, shall not affect cities of the second class.

§ 111. **Rate of taxation when not fixed by the board.** Except in the county of Kings, the county of Westchester and the city of Buffalo, there shall be annually levied and collected the following tax on dogs over four months old: Upon every bitch owned or harbored by any one or more persons, or by any family, three dollars; upon every additional bitch owned or harbored by the same person or persons or family, five dollars; upon every dog other than a bitch owned or harbored by one or more persons, or by any family, fifty cents; and upon every additional dog, other than a bitch, owned or harbored by the same person or persons or family, two dollars.

§ 112. **Owner to deliver description.** The owner and possessor of every dog liable to such tax, shall, whenever required by any assessor, deliver to him a written description of every such dog owned or possessed by him. For every neglect or refusal so to do, and for every false statement made in any description so furnished, he shall forfeit five dollars, to be recovered by the supervisor of the town.

§ 113. **Tax, how collected.** The assessors of every town, city or ward, shall annex to the assessment-roll of real and personal estate therein, made by them annually, the name of each and every person liable to the tax imposed thereby, together with the number of bitches and dogs for which such person is assessed, and return the same to the supervisors of their respective towns, cities or wards, to be laid by each supervisor before the board of supervisors, to be assessed and collected in the same manner as other state, county and town taxes are collected; and if any person duly assessed, shall refuse or neglect to pay the tax so assessed, within five days after demand thereof, it shall be lawful for any person, and it shall be the duty of the collector to kill the dog so taxed.

§ 114. **Application of proceeds of tax and other moneys.** The collector of each town shall pay over the taxes so collected to the supervisor of the town, and the moneys so collected and paid over shall, in each town, constitute a town fund for paying the damages arising in such town from dogs killing or injuring sheep or angora goats; and such moneys, or the balance thereof, which shall remain in the hands of the supervisor of any town for the period of one year, may, by a vote of the town board of any town, be appropriated for the purpose of building and repairing highways and bridges or for the payment of the contingent expenses of such town.

If such town fund applicable to the payment of such damages becomes exhausted and claims for damages are thereafter presented, the supervisor may certify the fact to the treasurer of any village in his town, in which a resolution of the board of supervisors is in force pursuant to the provisions of sections one hundred and twenty-eight to one hundred and thirty-six of this chapter, and shall thereupon be entitled to receive from said treasurer the amount of all such unpaid claims, or so much thereof as may then be in the hands of such treasurer applicable to such purposes and accumulated since the close of the last preceding fiscal year of such village; and the moneys thus received by the supervisor shall be applied to the payment of such damages.

§ 115. **Collector's fees.** Each collector shall be allowed to retain a commission of ten dollars on every hundred dollars collected, and at that rate upon all sums collected by him pursuant to this article, and upon filing his affidavit of the fact with the supervisor, be entitled to retain, as a further compensation from the moneys collected by him, the sum of one dollar for every dog or bitch killed by him under the provisions of this article.

§ 116. **When payment of tax to be proved.** In any action brought for the killing of any dog, it shall be incumbent on the plaintiff in such action to prove that the tax imposed upon such dog, if any, by the provisions of this article, has been paid.

§ 117. **Liability of owners of dogs for injuries.** The owner or possessor of any dog that shall kill, injure or wound any sheep or lambs, or angora goats or kids, shall be liable for the value of such sheep or lamb, or angora goat or kid, to the owner thereof, without proving notice to the owner or possessor of such dog, or knowledge by him that his dog was mischievous or disposed to kill or injure sheep or angora goats. In any action brought against the owner or possessor of a dog for the injuring of sheep, lambs, angora goats or kids, the injury for which a recovery may be had may include the permanent fright of such sheep, lambs, angora goats or kids caused by the chasing or worrying thereof by such dog; and if prima facie evidence be adduced by the plaintiff of such worrying or chasing it shall be incumbent on the defendent to prove that the same did not result in the permanent fright of the sheep, lambs, angora goats or kids alleged to have been injured. The terms "injury" or "injuring," as used in section one hundred and fourteen and the ensuing sections of this article, in relation to the claims of an owner of any sheep, lambs, angora goats or kids, against the owner or possessor of the dog or against a town or a town fund, or in relation to the purposes for which taxes, penalties or other moneys, shall be applied, shall include injury consisting of permanent fright of sheep, lambs, angora goats or kids, caused by the worrying or chasing thereof by a dog. (*As amended by Chapter* 200 *of the Laws of* 1912.)

§ 118. **Duties and powers of fence viewers.** The owner of any sheep or lambs, or angora goats or kids, that may be killed or injured by dogs, may apply to any two fence viewers of the town, village or city where such sheep or lambs, or angora goats or kids were killed or injured, who shall inquire into the matter, and examine witnesses in relation thereto, and if they shall be satisfied that the same were killed by dogs, and in no other way, they shall certify such fact, the number of sheep or angora goats killed, and the number injured and the value of the sheep or angora goats killed or injured immediately previous to such killing or injury, the value of the sheep or angora goats after being so killed or injured, together with the amount of their fees.

§ 119. **Certificate to be evidence.** Such certificate shall be presumptive evidence of the facts therein contained, in any civil action or proceeding.

§ 120. **Duties of town board.** Such certificate shall be presented to the town board at its second annual meeting for audit; and if such board shall be satisfied by the oath of the person claiming such damages that he has not been able to discover the owner or possessor of the dog or dogs, by which such damage was done, or that he has failed to recover his damages of such owner or possessor, it shall give an order on the supervisor of the town for the amount which it shall allow, who shall pay such order out of the funds arising from the provisions of this article.

§ 121. **Tax to pay orders for sheep or angora goats killed.** Whenever the amount of the orders for damages, given by the town board to the owners of sheep or angora goats killed or injured by dogs, shall exceed the amount of the dog fund in the hands of the supervisor of such town, the town board may, in its discretion, add to the accounts of such town, the amount of such orders then due and unpaid, but the amount so added shall not exceed the sum of three hundred dollars in any one year.

§ 122. **When owner shall refund.** If, after receiving the amount of such damages from the supervisor, the owner of the sheep or angora goats so killed or injured shall receive or recover the value or any part thereof, from the owner or possessor of the dog or dogs doing the damage, he shall repay to the supervisor the sum so recovered. In case of his refusal or neglect, the supervisor shall bring an action therefor against him in the name of the town, which sum, when received, shall be returned to the dog fund of the town.

§ 123. **Dogs chasing sheep or angora goats to be killed.** Any person may kill any dog which he shall see wrongfully chasing, worrying or wounding any sheep or angora goats.

§ 124. **Owner to kill dog after notice.** The owner or possessor of every dog, to whom notice shall be given of any injury done by his dog to any sheep or angora goat, or of his dog having chased or worried any sheep or angora goat, shall, within forty-eight hours after such notice, cause such dog to be killed; for every neglect so to do, he shall forfeit two dollars and fifty cents, and the further sum of one dollar and twenty-five cents for every forty-eight hours thereafter, until his dog shall be killed, unless it shall satisfactorily appear to the court before which an action shall be brought for the recovery of the said penalties, that it was not in the power of such owner or possessor to kill such dog.

§ 125. **When justice may order dog killed.** If any dog shall attack any person peaceably traveling on any highway, or his horse or team, or any domestic animal peaceably traveling on any highway in charge of any such person, and complaint thereof be made to a justice of the peace, such justice shall inquire into the complaint, and if satisfied of its truth, and that such dog is dangerous, he shall order the owner or possessor of such dog to kill him immediately. The owner or possessor of any dog, who shall refuse or neglect to kill him within forty-eight hours after having received such order, shall forfeit the sum of two dollars and fifty cents, and the further sum of one dollar and twenty-five cents for every forty-eight hours thereafter, until such dog is killed.

§ 126. **Who deemed owner of dog.** Every person in possession of any dog, or who shall suffer any dog to remain about his house for the space of twenty days, previous to the assessment of a tax or previous to any injury, chasing or worrying of sheep or angora goats, or any such attack made by a dog, shall be deemed the owner of the dog for all the purposes of this article.

§ 127. **Penalties, collection and application of.** The penalties imposed by this article for failure to kill dogs as prescribed therein shall be collected by the supervisor of the town where they are incurred, upon complaint being made to him of such failure, in the manner provided by the town law for the recovery of penalties given by law to a town for its use. Such penalties when so collected shall be paid into the town fund provided by this article for the payment of damages incurred by dogs killing sheep or angora goats in such town.

§ 128. **Adoption by county of dog registration provisions.** The board of supervisors of any county may, by resolution adopted at an annual meeting, determine that the provisions of sections one hundred and twenty-eight to one hundred and thirty-six, both inclusive, of this article shall apply to such county, or to any specified town or village therein, after a date to be designated in such resolution, which date shall be subsequent to the last publication of the resolution as herein required, but no such resolution shall be adopted affecting any town or village in such county separately, except upon the written application of the town board of such town or the trustees of such village. Such resolution shall also prescribe the annual registration fee to be paid within such county, or within the several towns or villages specially affected by it, for every dog over four months old. A certified copy of such resolution shall be filed in the offices of the secretary of state and of the county clerk of such county, and also in the office of the clerk of the town or village affected by any such resolution if it relates to a single town or village; and such resolution, together with sections one hundred and twenty-eight to one hundred and thirty-six, both inclusive, of this article, shall be published once in each week for six successive weeks in at least two newspapers published in the county to be designated by the board of supervisors, one of which shall be a newspaper published in the town or village specially affected, if such resolution relates to a single town or village and there be a newspaper published therein. After the date specified in such resolution, which shall be subsequent to such publication, no taxes upon dogs shall be assessed in any town or village in such county affected by such resolution, and the board of supervisors may at any subsequent meeting thereof prescribe a different annual registration fee, but must publish such change at least once each week for three successive weeks in at least two newspapers to be designated by the board of supervisors, but such registration fee must be uniform in any one year in all the towns and villages of the county to which such sections of this article are then applicable. The board of supervisors of such county may thereafter, by resolution adopted, filed and published in like manner, determine that the provisions of such sections shall not apply to such county, or to any separate town or village therein to which such provisions have been made to apply as aforesaid, and after the date specified in such resolution the provisions of law for assessment and collection of taxes on dogs shall apply to such county or to any separate town or village affected by the resolution last above mentioned, as if the resolution applying such sections had not been adopted.

When a resolution is in force which applies such sections to any town and to any village therein, separately, it shall be deemed to mean that the said sections apply, in respect to such town, to that portion thereof only which is outside of the corporate limits of such village and to the dogs owned or harbored in such outside territory. None of the provisions of this or of the ensuing sections of this article shall apply to any village situate in two or more counties, or to any village in two or more towns, unless a resolution is in force which applies such sections to all parts of the towns in which such villages are situate.

§ 129. **Payment of fees; issue of tags; definition of dog.** Within thirty days after the date specified in any such resolution making sections one hundred and twenty-eight to one hundred and thirty-six, both inclusive, of this article applicable to any county or to some specified town or village, every person resident within a town or village to which such resolution applies, owning or harboring a dog over four months old shall pay to the town clerk of the town or the clerk of the village in which he resides the registration fee prescribed by such resolution; and every person who shall thereafter acquire or harbor such a dog for which such registration fee has not been paid shall pay such fee within ten days after acquiring or harboring the same. A fee so paid shall entitle such dog to registration until the thirty-first day of December following such payment; and thereafter on or before the tenth day of January in each year a like fee shall be paid by a person owning or harboring such dog. Upon the receipt thereof, the town or village clerk, as the case may be, shall enter in a book kept for that purpose the name of such owner or person,.a description of such dog, and the date of the payment of the registration fee; and shall furnish for the use of such dog a suitable metallic tag stamped with the year of issuance and with a number corresponding with the registration number of such dog. Such tag shall be worn by such dog at all times during the year for which the registration fee shall be so paid. The town or village clerk, as the case may be, shall furnish a duplicate of such tag, whenever the same shall be lost, upon payment of the cost thereof. The expense of procuring such tags shall be paid in the same manner as other town or village charges, respectively, from the moneys received from the registration fees. The term " dog," as used in sections one hundred and twenty-eight to one hundred and thirty-six, both inclusive, of this article, includes bitch.

§ 130. **Duties of assessors.** The assessors of each town in such county shall annually, at the time of the completion of their assessment-rolls as provided by law, make a list containing the name of every person resident within their town liable to pay a registration fee for dogs as provided by section one hundred and twenty-nine of this article, together with the number of dogs owned or harbored by such person, and forthwith deliver such list signed by them to the town clerk.

If a resolution of the board of supervisors is separately in force in any village providing for a registration of dogs therein, then the assessors or assessing officers of such village shall in like manner file with the village clerk a like list of the dogs owned or harbored by the residents thereof.

§ 131. **Duty of town clerk.** The clerk of each town or village wherein said resolution is applicable, in such county, when he shall be informed by such list or otherwise that there is any dog which has not been registered, shall forthwith bring an action as prescribed in the next section against the owner of such dog or the person harboring the same, or he shall forthwith give written notice to any constable of the town, or if in a village then to any policeman or other peace officer thereof, requiring him to take such dog into his possession, and dispose of the same as prescribed in section one hundred and thirty-three of this article.

§ 132. **Penalties; actions therefor.** Every person liable to pay a registration fee for a dog who shall fail to pay the same as herein provided, or who shall knowingly permit any dog, owned or harbored by him, to be at large without wearing a tag issued by the town or village clerk, shall forfeit the sum of five dollars, to be recovered in an action brought before a justice of the peace of the town wherein the person owning or harboring such dog may be, in the name of the town or village in which such dog is required to be registered, upon the complaint of the town or village clerk, respectively, as the case may be; and the justice before whom a judgment for such penalty is recovered shall direct, in the execution issued upon such judgment, that, in case of the failure to collect the whole of such judgment besides costs, the dog for which such registration fee has not been so paid, or which has been so permitted to be at large, shall be taken into the possession of the constable receiving such execution and forthwith killed by shooting, and thereupon it shall be the duty of such constable to take such dog into his possession and forthwith kill the same. A judgment so recovered shall not constitute a bar to a further action to recover such penalty brought subsequent to the recovery of such judgment so long as such violation shall continue, nor shall the recovery or collection of such judgment exempt the person against whom the same is recovered from a compliance with any provision of sections one hundred and twenty-eight to one hundred and thirty-six, both inclusive, of this article.

§ 133. **Seizure of dogs not tagged or registered.** Each constable in such county where such resolution shall be made applicable to the whole county and each constable in the town or policeman or peace officer in the village to which such resolution shall be made applicable, where such resolution shall be made applicable to one or more towns or villages only, shall, after the expiration of such thirty days from the date specified in such resolution, seize and keep in his possession, until disposed of as herein provided, every dog running at large in his county, town or village, respectively, and not wearing such tag, and every dog of which he shall be informed by the clerk of his town or village by written notice. He shall forthwith post a notice in a conspicuous place in the office of the town clerk, or clerk of the village, as the case may be, containing a description of the dog so seized, and a statement of the time of seizure thereof, and that the said dog will be killed at the end of seventy-two hours from the time of posting such notice, stating the hour of such posting, unless the same is registered and the fee for seizing the same as herein provided is paid within such time, and shall also serve a copy of the notice so posted, at least forty-eight hours before such dog shall be killed, upon the owner or person harboring such dog, provided that he be known to such constable, policeman or peace officer, or can with reasonable diligence be ascertained by him within said county, personally or by leaving the same at his last known place of residence with a person of suitable age and discretion. Such officer shall at the end of seventy-two hours from the time of posting and after so serving such notice kill such dog by shooting, unless the same shall, before the expiration of that time, be registered and a tag procured for the same as provided in section one hundred and twenty-nine, and in addition thereto, the sum of two dollars be paid to such officer for his fees, in which case such dog shall be released. Every officer shall be entitled to receive a fee of one dollar for each dog seized and killed by him under the provisions of this section or of section one hundred and thirty-two of this article, to be paid as other town charges are paid from moneys received from registration fees. Town boards may appoint and employ one or more persons to perform the services which constables and other peace officers are authorized to perform in the seizure, detention and final disposition of dogs found running at large in their towns and not wearing a tag as *heren provided, and may provide for the payment of the

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* So in original.

persons so appointed and employed, for the services rendered by them. (*As amended by chapter* 629 *of the Laws of* 1913.)

§ 134. **Value to be recovered.** The value of any dog destroyed by any constable except as herein provided may be recovered by the owner of such dog from either such constable or the town therein such dog is destroyed.

§ 135. **Disposition of registration fees and penalties.** The town clerk shall at the end of every calendar month pay to the supervisor all fees received by him during such month for the registration of dogs and bitches under this article, less the sum of twenty-five cents for each dog and bitch registered, which may be retained by him as his fee therefor. Any village clerk receiving such fees or the proceeds of penalties provided for by this chapter shall pay over the same monthly, less such registration fees, to the village treasurer, and the latter shall retain the same in a separate fund until the close of the fiscal year of such village, excepting that he shall, from time to time, pay therefrom to the supervisor of the town in which such village is located any portion thereof which the supervisor certifies to be needed for satisfying claims for the killing or injuring of sheep in such town after the other moneys in the hands of the supervisor, applicable to such purposes, have been exhausted. Any part of such fund in the hands of a village clerk and treasurer not so paid out and remaining in their hands at the close of such fiscal year shall belong to the village and may be applied to such village purpose as the trustees thereof may direct. A justice of the peace before whom a penalty is recovered as provided in section one hundred and thirty-two of this article, if the complaint was made by a town clerk, shall forthwith pay one-half thereof, when collected, to the supervisor, and one-half to the town clerk for his fees in making the complaint in the action in which such penalty is recovered. The money paid to the supervisor pursuant to this section on account of registration fees and penalties, or paid to him by any village clerk under the provisions of this section, shall, except as otherwise provided herein, be applied for the same purposes as provided by law with respect to taxes collected upon dogs. If the complaint in any action for such penalty was made by a village clerk, then the whole of such penalty shall be paid to such clerk to be thereafter applied as hereinabove in this section provided.

§ 136. **Actions for injury or destruction of unregistered dogs.** No person shall hereafter maintain an action for an injury to or the destruction of any dog, unless it shall affirmatively appear that such dog has been duly registered as provided by section one hundred and twenty-nine of this article. Nothing in sections one hundred and twenty-eight to one hundred and thirty-six, both inclusive, shall apply to an incorporated city of the state.

ARTICLE 19 OF THE TOWN LAW;

Chapter 63 of the Laws of 1909 being chapter 62 of the Consolidated Laws as amended by the Laws of 1913.

Fences

Section 360. Apportionment of division fence.
361. When lands may lie open.
362. Division fence on change of title.
363. Settlement of disputes.
364. Powers of fence viewers.
365. Neglect to make or repair division fence.
366. Fence destroyed by accident.
367. Damages for insufficient fence.
368. Damages for omitting to build fence.
369. Use of barbed wire for division fence.

§ 360. **Apportionment of division fence.** Each owner of two adjoining tracts of land, except when they otherwise agree, shall make and maintain a just and equitable portion of the division fence between such lands, unless both of said adjoining owners shall agree to let their said lands lie open, along the division line, to the use of all animals which may be lawfully upon the lands of either. When the adjoining lands shall border upon any of the navigable lakes, streams or rivers of the state, the owners of the lands shall make and maintain the division fence between them down to the line of low water mark, in such lakes, streams or rivers, except those lands which overflow annually so as to be so submerged with water that no permanent fence can be kept thereon, and known as low flat lands; and when adjoining lands shall be bounded by a line between the banks of streams of water not navigable, and the owners or occupants thereof cannot agree upon the manner in which the division fence between them shall be maintained, the fence viewers of the town shall direct upon which bank of the stream, and where the division fence shall be located, and the portion to be kept and maintained by each adjoining owner. (*As amended by chapter* 86 *of the Laws of* 1911.)

§ 361. **Lands lying open.** When the owners of adjoining lands shall choose to let them lie open, as provided in section three hundred and sixty, neither of such owners shall be liable to the other in any action or proceeding for any damages done by animals lawfully upon the former's premises going upon the lands so lying open or upon any other lands of the owner thereof through such lands so lying open. Either owner of any lands so lying open and adjoining, may, unless the agreement is for a specified period, and after such agreement has expired may then have the same enclosed, by giving written notice to that effect to the owners or occupants of the adjoining lands, whereupon it shall be the duty of both parties to build and maintain their several proportions of a division fence. (*As amended by chapter* 86 *of the Laws of* 1911.)

§ 362. **Division fence on change of title.** Whenever a subdivision, or new apportionment of any division fence shall become necessary by reason of transfer of the title of either of the adjoining owners, to the whole, or any portion of the adjoining lands, by conveyance, devise or descent, such subdivision or new apportionment shall thereupon be made by the adjoining owners affected thereby; and either adjoining owner shall refund to the other a just proportion of the value at the time of such transfer of title, of any division fence that shall theretofore have been made and maintained by such other adjoining owner, or the person from whom he derived his title, or he shall build his proportion of such division fence. The value of any fence, and the proportion thereof to be paid by any person, and the proportion to be built by him, shall be determined by any two of the fence viewers of the town, in case of disagreement.

§ 363. **Settlement of disputes.** If disputes arise between the owners of adjoining lands, concerning the liability of either party to make or maintain any division fence, or the proportion or particular part of the fence to be made or maintained by either of them, such dispute shall be settled by any two of the fence viewers of the town, one of whom shall be chosen by each party; and if either neglect, after eight days' notice to make such choice, the other party may select both. The fence viewers, in all matters heard by them, shall see that all interested parties have had reasonable notice thereof, and shall examine the premises and hear the allegations of the parties. If they can not agree, they shall select another fence viewer to act with them, and the decision of any two shall be reduced to writing, and contain a description of the fence, and the proportion to be maintained by each, and shall be forthwith filed in the office of the town clerk, and shall be final upon the parties to such dispute, and all parties holding under them.

§ 364. **Powers of fence viewers.** Witnesses may be examined by the fence viewers on all questions submitted to them; and either of such fence viewers may issue subpœnas for witnesses, who shall receive the same fees as witnesses in a justice's court. Each fence viewer thus employed shall be entitled to one dollar and fifty cents per diem. The party refusing or neglecting to pay the fence viewers or either of them shall be liable to an action for the same with costs.

§ 365. **Neglect to make or repair division fence.** If any person who is liable to contribute to the erection or repair of a division fence, shall neglect or refuse to make and maintain his proportion of such fence, or shall permit the same to be out of repair, he shall be liable to pay the party injured all such damages as shall accrue thereby, to be ascertained and appraised by any two fence viewers of the town, and to be recovered with costs. The appraisement shall be reduced to writing, and signed by the fence viewers making it. If such neglect or refusal shall be continued for the period of one month after request in writing to make or repair the fence, the party injured may make or repair the same, at the expense of the party so neglecting or refusing, to be recovered from him with costs.

§ 366. **Fence destroyed by accident.** Whenever a division fence shall be injured or destroyed by floods, or other casualty, the person bound to make and repair such fence, or any part thereof, shall make or repair the same, or his just proportion thereof, within ten days after he shall be so required by any person interested therein. Such requisition shall be in writing, and signed by the party making it. If the person so notified shall refuse or neglect to make or repair his proportion of such fence, for the space of ten days after such request, the party injured may make or repair the same at the expense of the party so refusing or neglecting, to be recovered from him with costs.

§ 367. **Damages for insufficient fence.** Whenever the electors of any town shall have made any rule or regulation, prescribing what shall be deemed a sufficient division fence in such town, any person who shall thereafter neglect to keep a fence according to such rule or regulation shall be precluded from recovering compensation for damages done by any beast lawfully kept upon the adjoining lands that may enter therefrom on any lands of such person, not fenced in conformity to the said rule or regulation, through any such defective fence. When the sufficiency of a fence shall come in question in any action, it shall be presumed to have been sufficient until the contrary be established.

§ 368. **Damages for omitting to build fence.** If any person liable to contribute to the erection or repair of a division fence shall neglect or refuse to make and maintain his proportion of such fence, or shall permit the same to be out of repair, he shall not be allowed to have and maintain any action for damages incurred by beasts coming thereon from adjoining lands where such beasts are lawfully kept, by reason of such defective fence, but shall be liable to pay to the party injured all damages that shall accrue to his lands, and the crops, fruit trees and shrubbery thereon, and fixtures connected with the land, to be ascertained and appraised by any two fence viewers of the town, and to be recovered, with costs; which appraisement shall be reduced to writing and signed by the fence viewers making the same, but shall be only prima facie evidence of the amount of such damages.

§ 369. **Use of barbed or other wire for division fence.** Barbed or other wire may be used in the construction of any division fence, provided, however, that the person or corporation desiring to use such material shall first obtain from the owner of the adjoining property his written consent that it may be so used. If the owner of the adjoining property refuses to consent to the building of such a fence, it may nevertheless be built in the following manner: The fence shall be of at least four strands of wire with a sufficient bar of wood at the top; and the size of such top bars and of the posts and supports of such fence, and their distances apart, shall be such as the fence viewers of the town may prescribe, and with the posts no further apart than fourteen feet; and such fence shall be otherwise substantially built and a reasonably sufficient inclosure for holding the particular kind or class of cattle or animals usually pastured on either side of the fence. Nothing contained in section three hundred and sixty-seven shall be construed to authorize the electors of any town to prohibit the use of wire fences, for division fences, if such fences comply with the requirements of this section. Whenever such fence shall become so out of repair as to be unsafe, it shall be the duty of the owner or owners to immediately repair the same. But any person building such a fence without the written consent of the owner of the adjoining property shall be liable to all damages that may be occasioned by reason of such fence. But this section shall not be so construed as to permit railroad corporations to use barbed wire in the construction of fences along their lines contrary to the provisions of section fifty-two of the railroad law. (*As amended by chapter* 86 *of the Laws of* 1911.)

ARTICLE 20 OF THE TOWN LAW:

Strays

Section 380. Lien upon strays.
381. Notice of lien to town clerk.
382. Impounding strays.
383. Notice of strays to owner.
384. Charges for notice of strays.
385. Fees of fence viewers as to strays.
386. Foreclosure of lien upon strays.
387. Notice of sale of strays by fence viewers.
388. Proceeds of sale of strays.
389. Notice to owner of strays of fence viewers' meeting.
390. Duties of fence viewers as to strays.
391. Foreclosure of lien upon strays by action.
392. Duty of pound-master as to strays; fees.
393. Surplus money upon sale of strays.
394. Damages from other personal property.
395. Penalty for conversion of floating lumber.
396. Application of article.

§ 380. **Lien upon strays.** Whenever any person shall have any strayed horses, cattle, sheep, swine or other beasts upon his inclosed land, or shall find any such beast on land owned or occupied by him doing damage, and such beast shall not have come upon such lands from adjoining lands, where they are lawfully kept, by reason of his refusal or neglect to make or maintain a division fence required of him by law, such person may have a lien upon such beasts for the damage sustained by reason of their so coming upon his lands and doing damage, for his reasonable charges for keeping them, and all fees and costs made thereon, and he may keep such beasts until such damages, charges, fees and costs are paid, or such lien is foreclosed, upon complying with the provisions of this article relating thereto.

§ 381. **Notice of lien to town clerk.** If such beasts are not redeemed within five days after coming upon such lands, the person entitled to such lien shall deliver to the town clerk of the town, within which such lands or some part thereof shall be, a written notice subscribed by him, containing his residence, and a description of the beasts so strayed or coming upon his lands, as near as may be, and that he claims a lien on such beasts for such damages, charges, fees and costs. The town clerk shall record the notice in a book to be kept by him for that purpose, for which he shall receive ten cents for each beast, to be paid by the person delivering the notice. Such book shall always be kept open for inspection, and no fees shall be taken by the clerk therefor.

§ 382. **Impounding strays.** Within six days after such beasts shall have come upon such lands, such owner or occupant may cause them to be put in the nearest pound in the same town, if there be one, there to remain until they are redeemed, sold or reclaimed according to law. If there be no such pound, or he elects to keep such beasts, he shall cause them to be properly fed and cared for until they are redeemed, sold or reclaimed according to law.

§ 383. **Notice of strays to owner.** Within thirty days after any such beasts may have come or been found upon any lands, the owner or occupant of the lands shall serve a written notice, either personally or by mail, upon the owner of the beasts, if known, that they are upon his lands, or in pound, as the case may be, and are held by him as strays or beasts doing damage, as the case may be; and if such owner is not known, he shall publish such notice, within such time, in the nearest newspaper of the county for at least two successive weeks.

§ 384. **Charges for notice of strays.** The person delivering the notice to the town clerk shall be entitled to receive therefor, in addition to the fees paid the town clerk, fifteen cents each for all horses, mules, cattle and swine, and five cents for each other beast described in the notice. If the charges, damages, costs and fees are not agreed upon between the person delivering the notice and the owner of the beasts, they shall be determined by two fence viewers of the town, one of whom shall be selected by the person claiming the lien, the other by the fence viewer so selected. If such fence viewers can not agree, they shall select another to act with them, and the decision of any two of them shall be final.

§ 385. **Fees of fence viewers as to strays.** Each fence viewer shall be entitled to receive ten cents for every mile he shall be obliged to travel from his residence to the place where the beasts are kept, and seventy-five cents for a certificate of the charges as ascertained by them.

§ 386. **Foreclosure of lien upon strays.** If the owner of such beasts shall not redeem the same within three months after delivery of the notice to the town clerk, the person delivering the notice may foreclose his lien by action, or by a sale of the beasts, as herein provided. When a person claiming a lien, as herein provided, shall fail to establish the same, he shall not be entitled to receive anything for damages, charges, fees or costs, but shall be liable to pay all fees, costs and expenses incurred by reason of his keeping such beasts and the proceedings thereon.

§ 387. **Notice of sale of strays by fence viewers.** After such three months, a fence viewer of the town, on application of the person delivering the notice, shall give at least ten days' previous notice of the time and place of the sale of such beasts, by advertisement posted up in at least five public places in the town where such beasts may have been kept, one of which shall be at or near the outside door of the town clerk's office. At the time and place mentioned, such fence viewers shall sell such beasts to the highest bidder, unless redeemed by the owner.

§ 388. **Proceeds of sale of strays.** Out of the proceeds from such sale, the fence viewer shall retain and pay the sums charged for such notices, fees and costs, together with the sums specified in the certificate for keeping the beasts, and damages done by them; and the like charges for the sale as are allowed on sales under executions issued out of justices' courts, and he shall pay the residue to the owner of the beasts, if he shall appear and demand the same.

§ 389. **Notice to owner of strays of fence viewers' meeting.** When the owner of such beasts is known and resides in the same town where such beasts are kept, five days' notice of the time and place of the meetings of the fence viewers to determine the damages done by such beasts, and the charges for keeping them, shall be personally served on him; if he resides elsewhere, and his post-office address is known, such notice shall be served by mail or personally.

§ 390. **Duties of fence viewers as to strays.** The fence viewers shall view the premises where damages are claimed to have been done, and they may issue supoenas, examine witnesses and take any competent evidence of the facts and circumstances necessary to enable them to determine the matter submitted to them, and shall determine any dispute that may arise touching the sufficiency of any division fence around the premises where such damage was done, and from where and how the beasts came upon the lands of the person claiming such damages and charges; if they determine that for any cause the claimant's lien is not enforceable, they shall so certify, and the owner of the beasts shall thereupon be entitled to them without paying any charges thereon.

§ 391. **Foreclosure of lien upon strays by action.** When such lien is foreclosed by action, all questions relating to damages, charges, sufficiency of fence, and from where and how such beasts came upon the lands of the person claiming such damages and charges, shall be proven upon the trial of such action, and no certificate of fence viewers upon such questions shall then be necessary.

§ 392. **Duty of pound-master as to strays; fees.** Every pound-master shall receive and keep all beasts delivered to him as herein provided, until they shall be redeemed, sold or reclaimed. for which he shall be entitled to a reasonable compensation, not exceeding fifty cents per day for a horse or mule, twenty-five cents per day for each head of cattle, and fifteen cents per day for all other beasts, to be determined by the fence viewer making the sale, or the court before whom the action is tried, besides his fees for taking and discharging the beasts, to be paid by the owner of the beasts, if the lien is established, otherwise by the person claiming a lien thereon.

§ 393. **Surplus money upon sale of strays.** If the owner of the beasts shall not appear and demand the residue of such moneys within one year after the sale, he shall be thereafter precluded from recovering any part thereof, and the same shall be paid by the officer making the sale to the overseers of the poor of the town, or, in cities, to the officers having their powers, for the use of the poor thereof, and their receipt shall be a legal discharge to the keeper of such beasts and the officer selling the same. If the officer who shall have sold such beasts shall not, within thirty days after the expiration of the year, pay such moneys to the overseers of the poor of the town, or, in cities, officers having their powers, he shall forfeit to the town or city double the sum so remaining in his hands, together with the amount of such moneys.

§ 394. **Damages from other personal property.** When any person shall be authorized to distrain inanimate goods or chattels doing damage, or whenever any logs, timbers, boards or plank, in rafts or otherwise, or other personal property shall have drifted upon his lands, he shall be entitled to the same remedies, and shall proceed therein in the same manner and with the same powers as herein provided with respect to beasts found doing damage, so far as such provisions are applicable. He may at any time deliver his notice of lien to the town clerk, describing the property, and he shall keep the same in some convenient place, without removal to a pound, until the property is sold or reclaimed. The same officer shall conduct proceedings therein as in proceedings where beasts are found doing damage, and all proceeds of sale shall be in like manner, paid over and applied, subject to the same penalties and liabilities, and with the same force and effect.

§ 395. **Penalty for conversion of floating lumber.** Whoever shall convert to his own use, without the consent of the owner thereof, any logs, timber, boards or plank, floating in any of the waters of this state, or lying on the banks or shores of any such waters, or on any island where the same may have drifted, shall, for every offense, forfeit to the owner of such logs, or other lumber, three times the value thereof. Nothing contained in this section shall be construed to extend to that kind of lumber called drift-wood.

§ 396. **Application of article.** The villages and cities of this state shall be considered towns for the purposes of this article; and the trustees of the village and the aldermen of the city shall be fence viewers therein for the purposes of this article.

ARTICLE 21 OF THE TOWN LAW:

Pounds

Section 410. Erection and discontinuance of pounds.
411. Election of pound-masters.
412. Pound-master's fees.

§ 410. **Erection and discontinuance of pounds.** Whenever the electors of any town shall determine, at a biennial town meeting, to erect one or more pounds therein, and whenever a pound shall now be erected in any town, the same shall be kept under the care and direction of a pound-master, to be elected or appointed for that purpose. The electors of any town may, at a biennial town meeting, discontinue any pounds therein.

§ 411. **Election of pound-masters.** Pound-masters may be elected either (1) by ballot; (2) by ayes and noes, or (3) by the rising or dividing of the electors, as the electors may determine.

§ 412. **Pound-master's fees.** The pound-masters shall be allowed the following fees for their services, to wit: For taking into the pound and discharging therefrom every horse, mule and head of cattle, fifteen cents; for every other beast, ten cents.

CHAPTER 731, LAWS OF 1913.

AN ACT to provide for the compilation of certain data by the commissioner of agriculture, relative to state lands, and making an appropriation therefor.

Section 1. The commissioner of agriculture is hereby authorized and directed to make an examination, appraisal and report of all farm lands outside of the forest preserve heretofore acquired by the state by tax sales and the foreclosure of mortgages by the state loan commissioners. Such examination, appraisal and report shall be completed in detail and filed in the office of the commissioner before January first, nineteen hundred and fourteen. The report shall show the location of each tract or parcel of land, its description with common certainty, a description of the buildings and fences thereon and their condition, the kind and quantity of timber thereon, the commissioner's opinion as to the adaptability thereof to specified crops and his estimate of its actual market value. Such report shall also state which tracts, if any, should, in the opinion of the commissioner, be held by the state and reforested, and which of them are available and suitable for experimental use by agricultural colleges and schools or available for use by any of the public institutions of the state, and which of them should be sold. The commissioner may employ agents and appraisers in the prosecution of such work and incur necessary expenses, within the amount of the appropriation made by this act.

§ 2. The sum of five thousand dollars ($5,000), or so much thereof as may be necessary, is hereby appropriated out of any moneys in the treasury not otherwise appropriated for the purposes set forth in section one of this act, to be paid by the state treasurer on the warrant of the comptroller upon vouchers approved by the commissioner of agriculture.

SECTIONS 2 AND 70 OF THE LABOR LAW.

Chapter 36 of the Laws of 1909 being chapter 31 of the Consolidated Laws as amended by the Laws of 1913.

§ 2. **Definitions.** Employee. The term " employee," when used in this chapter, means a mechanic, workingman or laborer who works for another for hire.

Employer. The term " employer," when used in this chapter, means the person employing any such mechanic, workingman or laborer, whether the owner, proprietor, agent, superintendent, foreman or other subordinate.

Factory; work for a factory. The term " factory," when used in this chapter, shall be construed to include any mill, workshop, or other manufacturing or business establishment and all buildings, sheds, structures or other places used for or in connection therewith, where one or more persons are employed at labor, except dry dock plants engaged in making repairs to ships, and except power houses, generating plants, barns, storage houses, sheds and other structures owned or operated by a public service corporation, other than construction or repair shops, subject to the jurisdiction of the public service commission under the public service commissions law. Work shall be deemed to be done for a factory within the meaning of this chapter whenever it is done at any place, upon the work of a factory or upon any of the materials entering into the product of the factory, whether under contract or arrangement with any person in charge of or connected with such factory directly or indirectly through the instrumentality of one or more contractors or other third persons.

Factory building. The term " factory building," when used in this chapter, means any building, shed or structure which, or any part of which, is occupied by or used for a factory.

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§ 70. **Employment of minors.** No child under the age of fourteen years shall be employed, permitted or suffered to work in or in connection with any factory in this state, or for any factory at any place in this state. No child between the ages of fourteen and sixteen years shall be so employed, permitted or suffered to work unless an employment certificate, issued as provided in this article, shall have been theretofore filed in the office of the employer at the place of employment of such child. Nothing herein contained shall prevent a person engaged in farming from permitting his children to do farm work for him upon his farm. Boys over the age of twelve may be employed in gathering produce, for not more than six hours in any one day, subject to the requirements of chapter twenty-one of the laws of nineteen hundred and nine, entitled "An act relating to education, constituting chapter sixteen of the consolidated laws," and all acts amendatory thereof. (*As amended by chapter* 529 *of the Laws of* 1913.)

SECTIONS 5-a, 7, 9, 16, 16-a, 16-b, 17, 17-a, 17-b, 17-c, 18, 18-a, 253, 254, 255, 391 AND 392 OF THE GENERAL BUSINESS LAW RELATING TO WEIGHTS AND MEASURES:

Chapter 25 of the Laws of 1909 being chapter 20 of the Consolidated Laws as amended by the Laws of 1913.

§ 5-a. **Bottles or jars for milk and cream.** Bottles used for the sale of milk and cream shall be of the capacity of half gallon, three pints, one quart, one pint, half pint and one gill, filled full to the bottom of the cap ring or stopple. The following variations on individual bottles or jars may be allowed: six drams above and six drams below on the half gallon; five drams above and five drams below on the three pint; four drams above and four drams below on the quart; three drams above and three drams below on the pint; two drams above and two drams below on the half pint, and two drams above and two drams below on the gill. Bottles or jars used for the sale of milk shall have clearly blown, or otherwise permanently marked, in the sides or bottom of the bottle the name, initials or trademark of the manufacturer and a designating number, which designating number shall be different for each manufacturer and may be used in identifying the bottles. The designating number shall be furnished by the state superintendent of weights and measures upon application by the manufacturer, and a record of the designating numbers and to whom furnished shall be kept in the office of the superintendent of weights and measures.

§ 7. **Measure for bran.** The standard measure of capacity for bran and shorts shall be forty quarts to the bushel. The measure used for measuring such commodities shall be round, with a plain or even bottom, and it shall be thirteen and one-half inches in diameter in the clear at the top, and fifteen inches and one-half in diameter in the clear at the bottom, and of sufficient depth to contain such number of quarts, when stricken with a round, straight stick or roller of uniform diameter.

§ 16. **Method of sale of certain commodities.** All meat, meat products and butter, shall be sold or offered for sale by weight.

All other commodities not in containers shall be sold or offered for sale by standard weight, standard measure or numerical count, and such weight, measure or count shall be marked on a label or a tag attached thereto; provided, however, that vegetables may be sold by the head or bunch. (*As added by chapter* 81 *of the Laws of* 1912.)

§ 16-a. **Certain sizes of containers when used for vegetables, produce and fruit prescribed.** No person shall manufacture, sell, offer or expose for sale containers for vegetables, produce or fruit that are not of the capacity of one barrel, half-barrel, one bushel, or multiples of the barrel or sub-multiples of the bushel divisible by two; provided, however, that fruits, vegetables and produce may be sold in other sized containers if the net capacity in terms of standard dry measure is plainly and conspicuously marked, branded or otherwise indicated in the English language on the outside or top thereof, or is marked in accordance with the provisions of section seventeen. A barrel within the meaning of this and the ensuing sections of this article shall represent a quantity equal to seventy hundred and fifty-six cubic inches or conform to the following dimensions: Head diameter, seventeen and one-eighth inches; length of stave, twenty-eight and one-half inches; bilge not less than sixty-four inches outside measurement; distance between heads not less than twenty-six inches; and to be known as a standard barrel. A reasonable variation of the capacity specified shall be allowed. (*As added by chapter* 81 *of the Laws of* 1912.)

§ 16-b. **Standard grape basket.** The standard four-pound grape basket shall be of the following dimensions:

The bottom shall be three and five-eighths inches in width and nine and five- eighths inches in length; the height shall be four and one-quarter inches; the outside of the top shall be five inches in width and eleven inches in length, requiring a cover of five inches by eleven inches. The standard eight-pound grape basket shall be of the following dimensions: The bottom shall be four and three-fourths inches in width and twelve and one-fourth inches in length; the height shall be five and one-eighth inches; the outside of the top shall be six and one-half inches in width and fourteen and one-half inches in length, requiring a cover of six and one-half by fourteen and one-half inches. The standard twenty-pound basket shall be of the following dimensions: The bottom shall be seven and one-eighth inches in width and fifteen inches in length; the height shall be six and three-fourths inches; the outside of the top shall be nine and one-half inches in width and eighteen inches in length, requiring a cover of nine and one-half inches by eighteen inches. Any container complying with such dimensions and capacity need not be marked, tagged or otherwise branded, to indicate the net quantity of the contents, or to specify the same in terms of weight, measure or numerical count. No person shall manufacture, sell, offer or expose for sale, containers for grapes or other fruit, in this state, as the standard four-pound grape basket or the standard eight-pound grape basket, which are of less dimensions than those specified in this section, unless the net quantity of the contents of each container or a statement that the specified weight includes the container, the weight of which shall be marked, shall be plainly and conspicuously marked, branded or otherwise indicated on the side of such container, in terms of weight, measure or numerical count. (*As amended by chapter* 426 *of the Laws of* 1913.)

§ 17. **Net contents of containers to be indicated on the outside thereof.** When commodities are sold or offered for sale in containers of other sizes than those specified in section sixteen-a or whose sizes are not otherwise provided by statute, the net quantity of the contents of each container, or a statement that the specified weight includes the container, the weight of which shall be marked, shall be plainly and conspicuously marked, branded or otherwise indicated on the outside or top thereof or on a label or a tag attached thereto in terms of weight, measure or numerical count; provided, however, that reasonable variations shall be permitted. (*As added by chapter* 81 *of the Laws of* 1912.)

§ 17-a. **When sections sixteen, sixteen-a and seventeen shall not apply.** Sections sixteen, sixteen-a and seventeen shall not apply to containers or commodities in containers with ornamentations or decorations exclusively for gifts or social favors, or to commodities dispensed for consumption on the premises, or to commodities or containers put in receptacles used merely for the purpose of carrying or delivering of commodities or containers complying with the provisions of such sections, or when the numerical count of the individual units is six or less, or in the case of liquids when the contents is two fluid ounces or less, or when the weight of the contents is three avoirdupois ounces or less, or to commodities packed, put up or filled prior to eight months after this section takes effect, or to barrels, half barrels, quarter barrels, casks, kegs and packages used for the purpose of containing maltous beverages; or to bottles used for the purpose of the bottling of spirituous, maltous, vinous, or carbonated beverages until two years after this section takes effect. (*As amended by chapter* 514 *of the Laws of* 1913.)

§ 17-b. **Guaranty furnished by wholesaler, jobber or manufacturer.** No person shall be prosecuted under the provisions of this article, following section fifteen thereof, when he can show a guaranty signed by a wholesaler, jobber or manufacturer, residing in the state of New York from whom he purchased the commodity in containers to the effect that they were not incorrectly marked within the meaning of such sections of this article. The person making the sale and guaranty shall then be amenable to the prosecution, fines, and other penalties which would in due course attach to the dealer under the provisions of such sections. The name appearing on the container and the marking as provided by section seventeen shall be deemed to constitute a guaranty. (*As added by chapter* 81 *of the Laws of* 1912.)

§ 17-c. **Definition of terms "container" and "person."** "A container" as used in this article, following section fifteen thereof, shall include any carton, box, crate, barrel, half-barrel, hamper, keg, drum, jug, jar, crock, bottle, bag, basket, pail, can, wrapper, parcel or package. "A person" as used in such sections shall be considered to import both the singular and the plural and shall include corporations, companies, societies and associations, and whether acting through an agent or servant. (*As added by chapter* 81 *of the Laws of* 1912.)

§ 18. **Examination and prosecution.** The examination of the weight, measure or numerical count of the contents of containers as provided by section seventeen shall be made by the state superintendent of weights and measures or under his supervision or direction by any of the weights and measures officials of the state; except that in the city of New York such examination shall be made by the commissioner of the mayor's bureau of weights and measures of the city of New York. When after such examination there is cause to believe that a provision of section seventeen has been intentionally violated the state superintendent of weights and measures shall, after notifying in writing the person so accused of such accusation, certify the results to the attorney-general with a copy of the results of the examination duly authenticated under oath by the official making examination. The attorney-general shall cause appropriate proceedings in the name of the people of the state of New York to be commenced and prosecuted in the proper courts of the state without delay for the enforcement of the penalties therefor; except that in the city of New York the commissioner of the mayor's bureau of weights and measures shall in cases where he acts, after notifying in writing the person so accused of such accusation certify the result to the attorney-general, with a copy of the result of the examination duly authenticated under oath by the official making such accusation. Such attorney-general shall cause appropriate proceedings in the name of the people of the state of New York to be commenced and prosecuted in the courts of the state of New York without delay for the enforcement of the penalties therefor. The state superintendent of weights and measures with the co-operation of the chief or principal weights and measures officials of the cities of the first class shall establish uniform tolerances or amounts of reasonable variation and shall make uniform rules and regulations for carrying out the provisions of sections sixteen, sixteen-a, seventeen, seventeen-a and seventeen-b. (*As added by chapter* 81 *of the Laws of* 1912.)

§ 18-a. **Penalties.** A person violating any of the provisions of sections sixteen, sixteen-a, sixteen-b, seventeen, seventeen-b, shall be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars for the first and second violations, and by a fine of not less than one hundred dollars nor more than five hundred dollars for subsequent violations. (*As amended by chapter* 426 *of the Laws of* 1913.)

§ 253. **Presser of hay and straw defined; correct scales to be used; bales to be marked.** The term "presser" as used in this and the following sections of this article shall mean the person, firm, association or corporation owning or having possession and operating the hay press. A presser who presses hay or straw for market shall use correct scales, properly sealed. Every presser of hay or straw for market shall mark each bale of any of such commodities pressed by him with his name and business address and the correct weight of the bale. These markings shall be made upon a tag, securely fastened to the bale, of not less than one and one-half inches in width and three inches in length.

A person violating this section shall forfeit to the people of the state the sum of five dollars for each such violation. (*As amended by chapter* 96 *of the Laws of* 1913.)

§ 254. **Prohibition against the adulteration of hay.** No person shall put or conceal in any such bundle of hay any wet or damaged hay, or other materials, or hay of any inferior quality to that which plainly appears upon the outside of such bundle.

A person violating this section shall forfeit to the people of the state the sum of five dollars for each such violation.

§ 255. **Weight to be marked on bale.** The gross weight shall be plainly marked on each bale of hay or straw sold or offered for sale in this state; and no baled hay or straw shall be so sold or offered for sale which weighs less than such gross weight after deducting five pounds from such bale for shrinkage. And no baled hay or straw shall be so sold or offered for sale with more than twenty pounds of wood to the bale, the weight of which is two hundred pounds or upward, or more than ten pounds of wood for bales weighing less than two hundred pounds.

A person violating any provisions of this section shall forfeit to the people of the state the sum of five dollars for each such violation.

§ 391. **Penalties for marketing small fruits or baskets or selling fruit therein.** Any person in this state who sells or offers for sale fruit packages that are of less than the standard sizes and capacity as defined in section five, or any person who sells or offers for sale fruit in packages that are of less size or capacity than those defined in section five, shall be deemed guilty of a misdemeanor and upon conviction thereof in any court of competent jurisdiction shall be fined not less than five dollars and not more than twenty-five dollars, for each violation and each sale shall constitute a separate violation, but a variation of not more than seven per centum shall not be deemed a violation under this section. (*As amended by Laws of* 1909.)

§ 392. **Repacking fruit and farm produce.** A person, firm or association who purchases fruit or farm produce in barrels, boxes or other packages, and empties, or causes to be emptied, such barrels, boxes or other packages, and repacks, or causes to be repacked therein the same or other fruit or farm produce, shall, before any such repacked barrel, box or other package is sold, or offered or exposed for sale, erase or otherwise obliterate the name of the grower or producer, if found thereon. Every such person, firm or association selling, or offering or exposing for sale fruit or farm produce which has been emptied from and repacked in the barrels, boxes or other packages in which they were purchased, without erasing or otherwise obliterating the name of the grower or producer of such fruit or farm produce, if found thereon, as above provided, shall be subjected to a penalty of fifty dollars for each barrel, box or other package of fruit or farm produce so sold, offered or exposed for sale.

SECTIONS 20, a, b, c, d, e, f, g, h, i OF GENERAL BUSINESS LAW, RELATING TO DEPARTMENT OF FOODS AND MARKETS.

Section 20. Establishment of department of foods and markets; commissioner.
20-a. General powers and duties of commissioner.
20-b. Auction markets.
20-c. Licensed auctioneers.
20-d. Commissions.
20-e. Inspection of produce.
20-f. Consignment to auction market.
20-g. Bulletins; lists of producers and consumers.
20-h. Additional duties of department.
20-i. Offenses.

§ 20. **Establishment of department of foods and markets; commissioner.** There is hereby established a department of foods and markets. The head of such department shall be known as the commissioner of foods and markets. He shall be appointed by the governor for a term of six years, and shall be entitled to receive an annual salary of six thousand dollars. The commissioner may employ such clerks and other employees as may be needed, and fix their compensation. The term "commissioner" as used in this article, means the commissioner of foods and markets.

§ 20-a. **General powers and duties of commissioner.** The commissioner of foods and markets shall

1. Investigate the cost of food production and marketing in all its phases;

2. Aid and assist in the organization of coöperative societies among producers and consumers for the purpose of securing more direct business relations between them, of promoting and conserving the interests of producers, and reduce the cost of living to consumers;

3. Hear complaints and suggestions; take testimony of witnesses and obtain evidence, and, for the exercise of such powers

may issue subpoenas and compel the attendance of witnesses and the production of evidence;

4. Advise and assist in the location and establishment of local markets whenever he determines that public necessity or the welfare of the community requires such markets provided he shall be satisfied that such markets will be successfully operated by a coöperative company;

5. Have power to make rules and regulations for the grading, packing, handling, storage and sale of all food stuffs within the state, not contrary to law, and to enforce such rules and regulations by actions or proceedings in any court of competent jurisdiction;

6. Make an annual report to the legislature on or before the first day of February in each year, in which he shall summarize the work done by the department during the preceding calendar year, together with a statement of the plans for the development of the work of the department for the current year, and a detailed budget of the financial requirements of the department;

7. Have such other powers and perform such other duties as are prescribed by this article.

§ 20-b. **Auction markets.** The commissioner shall cause to be established at such points in the state as he deems advisable, auction markets, and for such purpose may lease premises therefor or acquire such premises by purchase, or by condemnation, if unable to agree with the owner upon a price therefor. Upon the establishment of such market the commissioner shall cause a notice to be published in such manner as he deems proper, stating that such market has been established and that farm produce, as defined in section two hundred and eighty-two of the agricultural law, may be consigned to a licensed auctioneer at such market for sale at public auction by such licensed auctioneers of the department of foods and markets at such market, as hereinafter provided. The commissioner shall have power to make regulations, not inconsistent with law, for operating the facilities in such auction markets, leasing space therein and otherwise regulating the management thereof.

§ 20-c. **Licensed auctioneers.** Upon the establishment of an auction market, the commissioner shall issue a license to such persons as qualify, as hereinafter provided, in the city, town or village in which such market is located, authorizing them to act as official auctioneers for the department of foods and markets, in the sale of such goods consigned to such market. Such license shall be issued upon written application to the department of foods and markets, stating the full name of the person applying for such license, his address, and such other facts as to his character, responsibility and experience, as the commissioner shall require. The issuance of such license shall be in the discretion of the commissioner and shall be without charge. The commissioner shall require a person licensed as an auctioneer pursuant to this section to execute and deliver to him a fidelity bond with satisfactory sureties in such sum as the commissioner may determine, not less than one thousand nor more than three thousand dollars, conditioned for the faithful performance of his duties and the faithful accounting to a consignor of all moneys to which such consignor may be entitled after the deduction of commissions and other expenses authorized by this article. Such auctioneers shall receive no compensation from the state, but shall be entitled to charge commissions for the sale of farm produce, in accordance with the schedules of the department of foods and markets. Every shipper consigning food produce to such licensed auctioneers for sale shall be charged, in addition to the commission of the licensed auctioneer, as above provided, an additional commission of three per centum of the gross amount received for such produce, which shall be paid into the state treasury and applied to the support of the department hereby created.

§ 20-d. **Commissions.** The commissioner shall adopt, and may from time to time amend, a schedule of commissions which official auctioneers shall be authorized to charge for the sale of farm produce at public auction at auction markets under the jurisdiction of the department of foods and markets. Such commissions may vary according to the quality and character of the produce, the size of the lots and number or quantity of the articles sold. The commissioner shall also establish a schedule of charges for inspection by the department of foods and markets.

§ 20-e. **Inspection of produce.** The department of foods and markets, through experts employed for such purpose, shall have power to inspect and determine the grade and condition of farm produce both at collecting centers and receiving centers.

§ 20-f. **Consignment to auction market.** The commissioner may, in the establishment of an auction market, also prescribe the zone from which farm produce may be consigned thereto. The department of foods and markets shall make arrangements for a proper place and be responsible for the safeguarding of food produce consigned to auction markets established by it. Farm produce so consigned to an auction market shall be received by the licensed auctioneer or auctioneers of the department of foods and markets, who shall proceed to sell such produce at public auction as auctioneers for the consignor at the best price obtainable therefor. If for any reason such an auctioneer be unable to sell any portion of such produce at public auction, or if he be unable to sell it at auction at a satisfactory price, such unsold portion may be distributed and sold at private sale at the best price obtainable therefor. After such sale, such auctioneer shall deduct his commissions and other authorized charges, and promptly transmit the balance to the consignor.

§ 20-g. **Bulletins; lists of producers and consumers.** The department of foods and markets shall publish a daily bulletin, setting forth the quotations for which produce has been sold for the preceding day in all the principal markets of the state, including the auction markets established by the department of the foods and markets, and also giving advice as to the available supplies of the principal farm produce, and as to the demand in the several markets for local as well as foreign produce. The department of foods and markets shall also prepare from time to time bulletins as to the most efficient methods of standardization, packing and transportation, and cause notice thereof to be distributed in such manner as the commissioner may determine. The department of foods and markets shall also investigate the source of supply of food produce and prepare and publish lists of the names and addresses of producers and consignors and supply the same to persons applying therefor.

§ 20-h. **Additional duties of department.** The department of foods and markets, in addition to its other duties, shall investigate delays in transportation, and shall cause to be initiated proper proceedings to prevent restraint of trade or unlawful combinations to fix prices. It shall, when notified by producers, that food products produced within the state seem likely to spoil for lack of a ready market, make such suggestions to such producers or take such steps as seem advisable for facilitating the sale thereof.

§ 20-i. **Offenses.** Any licensed auctioneer doing business at an auction market established by the commissioner, as by this act provided, who shall

1. Impose false charges for handling or services in connection with farm produce; or

2. Fails to account for such farm produce promptly and properly and to make settlements therefor, with intent to defraud; or

3. Makes false or misleading statement or statements as to market conditions with intent to deceive; or

4. Directly or indirectly purchases for his own account goods received by him upon consignment; or

5. Makes false statements as to grade, condition, markings, quality or quantity of goods shipped or packed in any manner with intent to deceive; or

6. Makes any charge for commissions, or otherwise, in excess of those authorized by the department of foods and markets,

Is guilty of a misdemeanor, and the commissioner shall forthwith revoke the license granted to such auctioneer and direct his bond to be forfeited.

§ 2. The sum of fifteen thousand dollars ($15,000) is hereby appropriated out of any money in the treasury, not otherwise appropriated, for the purpose of carrying out the provisions of this act, payable by the treasurer on the warrant of the comptroller on the order of the commissioner of foods and markets.

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STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

CHARLES S. WILSON, Commissioner

Bulletin 73

Agricultural Advantages
# of the
Empire State

COMPILED BY
T. BOYNTON PECK
Secretary, Department of Agriculture

"The low-priced farm lands of New York State are the best investments in America."

JAMES WILSON

Former Federal Secretary of Agriculture

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FOREWORD

THE Empire State has a population of over ten millions, or one-tenth the population of the United States. Of this number, close to eight millions reside in the cities and towns of the State. If this enormous number of non-food-producing people is to secure its foodstuffs from their natural sources, it is the imperative duty of this Department, as well as of every agricultural agency in the State, to encourage and stimulate agricultural production to the fullest extent.

It is estimated that the annual food supply of Greater New York costs in the consumers' kitchens over $500,000,000. New York City's milk supply annually costs over $60,000,000. Her butter bill is in excess of $50,000,000, while cheese costs over $8,000,000. The poultry supply of the city is valued at $25,000,000 and for eggs New York pays $30,000,000 annually. Vegetables and fruits cost $5,000,000, while the city's meat bill reaches the stupendous sum of $100,000,000 annually.

Investigation of the source of supply of these seven principal foodstuffs shows that only one, cheese, is supplied in whole by the Empire State. Milk, after the State supply is exhausted, comes from states as far west as Ohio; butter from Ohio, Indiana, Illinois, Wisconsin, Iowa, North and South Dakota, Nebraska, Kansas, Oklahoma and Missouri; eggs from as far west as Nebraska, south to the Gulf and north to the Canadian line; vegetables and fruits from Cuba, Bermuda and all the coastwise states, and meat food products from all over the world.

It is apparent, without further citation of facts, that the Empire State is not furnishing her legitimate share of even Greater New York's foodstuffs, to say nothing of the amount required to feed her 57 cities and 465 incorporated villages. Because of the excessive charges accumulating through the process of gathering, shipping, transporting and distributing, we are confronted with the problem — the high cost of living. This is one of the problems which the Empire State, through her Department of Agriculture, is trying to solve.

The Empire State possesses in one section or another the chief agricultural attractions of other states, to which are added her unexcelled markets, her great transportation systems and her exceptional educational facilities. The fact that New York is the leading state of the Union in the power of her commercial and industrial enterprises has largely overshadowed the truth that she is and always will be the Empire State in the variety and special value of her agricultural products.

Today there are numbers of good farms in the Empire State with comfortable buildings, good fences and fields, which have been proven to be the equal of lands selling in the West for double and quadruple their price. Advanced age, poor health, death of the owner, settlement of an estate, are the reasons for these farms being upon the market at such low prices. These farms are the golden opportunity for the progressive farmer, wherever located, who wishes to better his condition.

The Empire State makes no apology for this condition. She is frank in her statement that she must have farmers — more and better farmers — if she is to continue to hold her place as an agricultural state, and approach the problem of feeding her people from her own plains and valleys.

Empire State Oats are Not Excelled by Those of Any Other State

THE EMPIRE STATE

Area. The Empire State ranks twenty-ninth in land area among the states and territories with 30,498,560 acres, of which 22,030,367 are land in farms. Although the acreage of many of the western states is greater than that of the Empire State, "it is the size of an acre of land that controls in the end, as the value of farm produce per acre is greater in the eastern states than in the western states," as Dean Liberty Hyde Bailey has well said.

Topography. The Empire State is characterized by its broad valleys, swelling uplands, rolling hills and tracts of forest-clothed mountains. With the Atlantic Ocean and Long Island Sound at the south, two of the Great Lakes — Lake Erie and Lake Ontario — at the north and west, three important rivers and a score of inland lakes of considerable size and great beauty, a diversity of surface features obtains, characterizing the Empire State for beautiful scenery. Springs, streams, rivers, natural ponds, and lakes of clear, pure water are found everywhere.

Climate. The climate of the Empire State is moderate, not running to either extreme of heat or cold. It is healthful and invigorating and free from malaria. Damaging frosts are so infrequent that it is unnecessary to consider them as factors in the situation. Floods, cyclones, destructive winds, storms and devastating pests are scarcely known.

Rainfall. The rainfall throughout the crop-growing period is so evenly distributed that serious crop failure in the Empire State is rare. The general average is about thirty-six inches

Rye is a Profitable Crop as Grown on this Tompkins County Farm

per annum for the State. Precipitation is greatest in June and least in October.

Population. The Empire State ranks first in population among the states and territories. The State census of 1915 gives a population of about ten and one-half millions. Fifty-two per cent of this vast population resides within the limits of Greater New York; seventy-eight per cent in cities of 25,000 inhabitants and over, and twenty-two per cent on farms and in hamlets, villages and cities of less than 25,000 inhabitants.

Farm Area and Value. The last Federal census gave the number of farms in the Empire State as 215,597; the total acreage in farms as 22,030,367, and the average size of the Empire State farm as 102.2 acres. The value of farm property, including buildings, fences and improvements, is given by the Federal census as $1,451,481,495, an increase over the last census of more than thirty-five per cent. The average value of all property per farm increased more than

Modern Farming Methods Insure Returns on Empire State Farms

forty-two per cent and the average value of land per acre increased thirty-two per cent in the ten-year period.

Markets. The fact that the Empire State has long since passed her speculative or uncertain era of development counts for much in the advantages offered to homeseekers. The centers of population are fixed with certainty. A man who locates a farm near a market can trust confidently, not only in the permanency of the market, but in the certainty of an increasing demand. Transportation facilities are such as to enable the farmer to ship conveniently, quickly and cheaply to the centers of population. Throughout the State everything fresh from the dairy, garden, greenhouse, field, pasture, vineyard, orchard, poultry-yard and berry patch is sought for. So great is the demand that, in many instances, buyers seek the farmer, and produce is sold at the farm. Canning plants scattered throughout the State demand thousands of tons of peas, sweet corn, tomatoes and fruits. Cold storage and evaporating plants dot the apple sections of the State. Stockyards at every station along the trunk and branch lines of railroads enable the farmer to market live stock with far greater ease and at much less cost than in any other State. The

The Empire State Hay Crop for 1915 is Over Five Million Tons

demand for live stock to be converted into dressed meats is greater than can be satisfied, even if the supply be increased manyfold.

Transportation. The lines of transportation in the Empire State are manifold and fixed. Trunk and branch lines of railroads, trolley lines, waterways and improved roads thread the State like a network, while the Erie canal, which upon completion will accommodate 2,000-ton barges, furnishes extremely cheap transportation to the many cities and towns along its line. It is difficult to find a farm that is not within easy driving or shipping distance of some important market. One-third the entire population of the United States is within twelve hours by express or thirty-six hours by freight of the farms of the Empire State.

The Empire State farmer has a decided advantage in the low transportation rates required to place his produce in the best markets of the country, and at the seaboard. Rates average less than one-half those of points in Indiana, Illinois, Iowa and Missouri. A comparison shows that the Empire State farmer markets his produce at a cost less than the Iowa farmer by $4.00 per ton on grain, $7.00 per ton on apples, $6.50 per ton on cattle, hogs and sheep, $6.00 per ton on hay, $6.60 per ton on potatoes and vegetables, $18.00 per ton on poultry and $13.40 per ton on butter — an advantage in almost every instance equal to a good profit.

Hops Make Money for the Schoharie County Owner of this Farm

Soils and Production. The soil of the Empire State is chiefly of glacial origin, which class of soil is noted the world over for its long-continued productiveness under fair treatment. The prevailing types of soil in the State are loam and clay loam, with alluvial soil in the valleys. The production per acre of any of the farm crops in the Empire State is a complete refutation of the assertion, ignorantly made, that our farm lands are poor or worn out. Land values are determined largely by the net value of crops which the land is capable of producing. Figures showing the relative value of many of the crops raised in the Empire State, as compared with those of other sections of the country where lands are valued at from 200 to 300 per cent more, show conclusively the capacity and value of Empire State soils.

To some extent, the areas which are characterized by the production of certain crops or agricultural industries possess distinct types of soil. Such divisions may be followed in describing the predominating soil types of the Empire State.

Great Lakes Area. South of Lake Ontario is a level plain noted for the production of apples of rich flavor and keeping quality. Pears are also grown and great peach orchards are

found near the lake. The eastern portion produces enormous quantities of strawberries and all truck crops. The counties of Niagara, Orleans, Monroe and Wayne are in the center of this region, but the adjoining counties also have much the same soil. Loam predominates in this section and is highly esteemed for the production of all fruits. The clay loam is adapted to grass and small grains and the sandy loam to small fruits and vegetables.

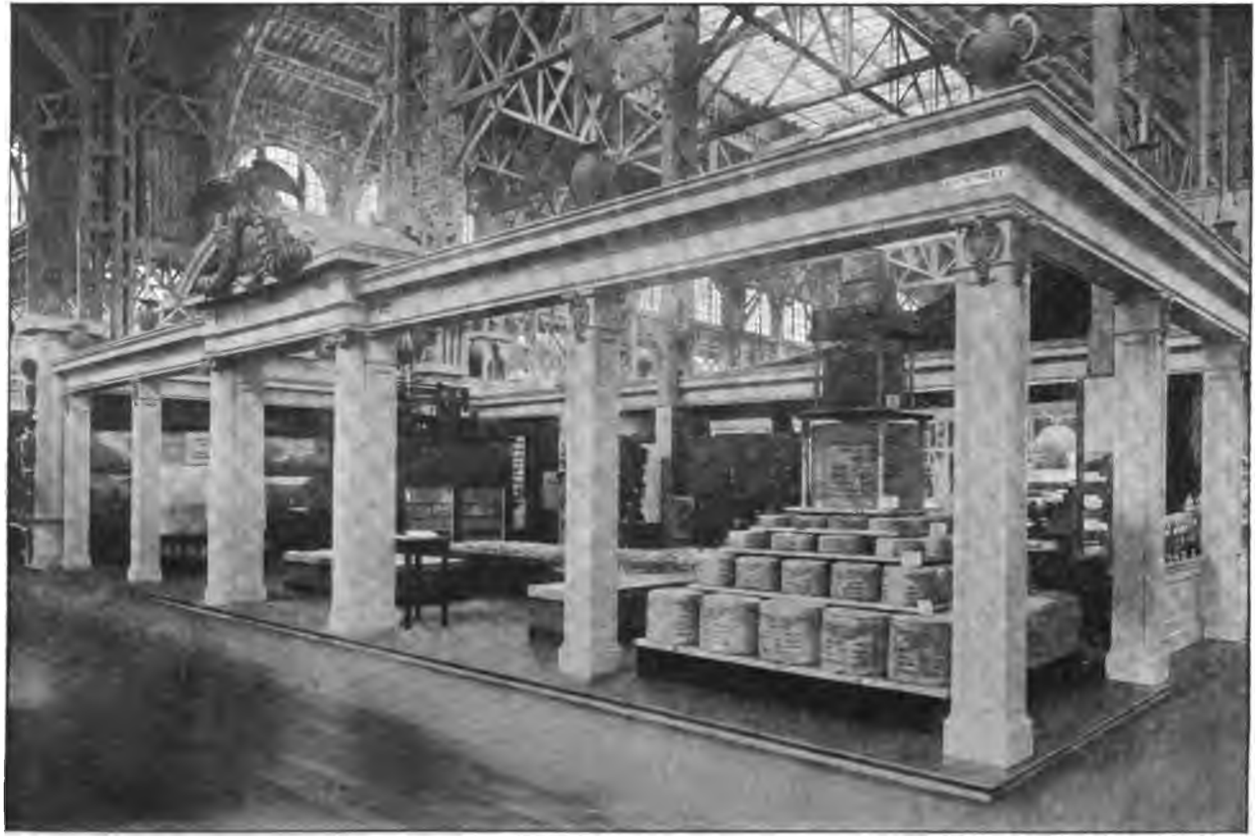
Great Plateau. South of this region, and reaching to the southern border of the State, is a plateau extending from the plain bordering Lake Erie to the Catskill Mountains. This plateau is cut by river valleys and the finger lakes. There are some hillsides where the plateau descends into these valleys, but back of these are great stretches of gently

Modern Machinery Characterizes New York State Threshing Lots

sloping land. This is a natural live stock country. Dairying, general farming and orcharding are the chief agricultural interests. In Wyoming, Livingston and Genesee counties there is extensive bean growing, while in the eastern section and around the finger lakes are extensive vineyards. Most of the soil is a loam, well adapted to all ordinary crops of the temperate zone, especially potatoes, buckwheat, timothy and redtop. The heavier soil is admirably adapted to grapes. This section should be developed as a live stock region and is within easy reach of the second largest live stock yards of the world at East Buffalo.

Long Island. Long Island constitutes a distinct agricultural area of the Empire State. Truck crops, melons, cucumbers, potatoes, asparagus, and all garden vegetables are grown in enormous quantities for the New York City markets. The sandy character of the soil makes it naturally well drained.

Mohawk and Hudson Valleys. Soils vary in different localities along these valleys. Along the Hudson is found one of the important fruit sections of the State. A few miles back, dairying and general farming are predominant agricultural interests. On the lower Hudson dairying is extensively carried



Empire State Agricultural Exhibit at the Panama-Pacific Exposition, 1915

This exhibit, in competition with the world, won one medal of honor, thirteen gold medals, twenty five silver medals, twenty one bronze medals and two mentions of honor

Tomatoes are Grown Extensively for Canning and the Markets

on because of the nearness to the New York City market. The Mohawk valley is noted as a general farming section.

North Country. The Champlain valley and the soil between the Adirondacks and the St. Lawrence river is of great fertility. It produces abundant crops of hay and other general farm crops, as well as considerable fruit. Dairying has progressed in this section, with special reference to the production of butter and cheese. Clover yields well and the fertility of the soil is easily maintained.

Highways. The Empire State is expending upwards of $150,000,000 in highway improvements. The system of highways, carefully planned with reference to the agricultural needs of the State, has been carried forward with such rapidity of construction that good macadam roads reach to all farming sections. Brick or cement roads supplant the macadam highways upon entrance to all important market centers, so that the heaviest loads of produce can be hauled by horse or tractor

Empire State Wheat Fields Promise Ample Profits to the Farmer

direct to the centers of population. In connection with the construction of artificial roads, a carefully planned system of development of all dirt roads is being carried out, so that there is no time of year when the farmer cannot easily and conveniently reach his markets.

Taxes. In comparison to other sections of the country, taxes in the Empire State are unusually low. In most sections of the State they average about one per cent of the actual value of the land. Live stock and tools are seldom if ever assessed. Taxes for State purposes are raised indirectly and are derived from excise, inheritance, corporation and various minor imposts. The cities of the State represent more than eighty-five per cent of the assessed valuation, leaving but fifteen per cent to be assessed upon the farms, in the event that indirect taxation fails to supply the sums needed and direct taxation is resorted to. The funds now raised by taxation are for county, township and school purposes.

Education. It is unnecessary to urge the Empire State's claim as an educational State or to enlarge upon her social advantages. With more than 10,620 school districts scattered throughout the State, no boy or girl need lack instruction or go far from the farm home to secure it. The village or city with its graded school, academy or college is within easy distance of the Empire State farm and great universities await those scholars who seek higher education. Traveling libraries reach every farm through the school districts, and, in the same way, exhibits of the world's art, and stereopticon slides upon numberless timely and educational subjects, are placed within the reach of every farm dweller.

Regulatory Laws — Cooperation. In no state is the farmer so protected in all his dealings as in the Empire State. The licensing and bonding of commission merchants handling farm produce assure prompt and full returns for all shipments. In the same manner the buyer of milk is prevented from practicing deception or dishonesty upon the farmer. With the passage of regulatory laws regarding the branding of feeding stuffs and fertilizers, Empire State farmers were assured of the purity and strength of such commodities. The enactment of laws permitting and encouraging the formation of cooperative organizations has resulted in the organization of over sixty such societies. Prices secured for produce sold through these societies has resulted in larger profits than before known, and in the same wise savings in the purchase of farm supplies have been greater.

Gooseberries Are Grown for Market in Western New York State

EDUCATION AND THE FARM

"I had for several weeks last fall at my door in the State Education Building an exhibit of potatoes, apples and other farm products raised by country schoolboys," writes Dr. John Huston Finley, Commissioner of Education for New York State; "these were interesting in themselves as showing what boys might do with hands otherwise mischievous, perhaps, or with fields otherwise less productive. But I kept thinking that it would be even more interesting and gratifying to see an exhibit of what these potatoes, apples and the like had made of the boys. I happen to know of one seemingly worthless boy who has been made into a promising man by a flock of white chickens."

There is nothing more important on the farm than the children. Fields may be made productive, yields increased tenfold, but if the children — the boys and girls who are to be the farmers and farmers' wives of the next generation — are neglected, there is something radically wrong with the scheme

Berkshire Swine Stand High in the Production of Pork Profits

of development. It is the right of the farm children to be fitted for life mentally, morally and physically. In the Empire State it is considered something more than a right — it is considered a demand ranking high in the program characterized by the term, " development of natural resources."

It is because of this view that the Empire State today ranks first among the states and territories in her educational facilities. It is because of this view that in the Empire State are agricultural educational agencies equaled nowhere in this United States and approached in few states. It is the belief of the Empire State that this system should be amplified and broadened until, as Dr. Finley has said, " it will, by bringing all agricultural educational agencies in this State into relationship with the school, as the center of humanity life, not only multiply milk and potatoes and apples, but conserve, develop and enrich our country life, and at last touch every country home."

Twenty years ago the Empire State was making appropriations aggregating four cents per capita for all purposes of agricultural education. Today these appropriations aggregate more than twenty-four cents per capita, and while that sum may seem large we must recognize the fact that of the taxes which bring it into the treasury, ninety per cent is paid by the cities and towns, because they recognize no difference between the man on the farm and the man in the town or city.

The development of the Department of Agriculture, which came into existence just prior to 1893, is one of the important

Shoulder-High Wheat on New York's Experimental Farm Field

eras in the development of the farmer in the Empire State. With the scheme of organization in the hands of broad-minded and farseeing men, the Department rapidly became one of the most important of the departments of State government, and in recent years its scope and plan has been so broadened as to comprehend much more than do the bureaus or divisions of agriculture in the states generally.

In recent years, the most important steps have been the establishing of agricultural courses in the public schools, the

Vitrified Tile Silos Mark the Progress of New York Farmers

Strawberries are a Profitable Truck Crop in New York State

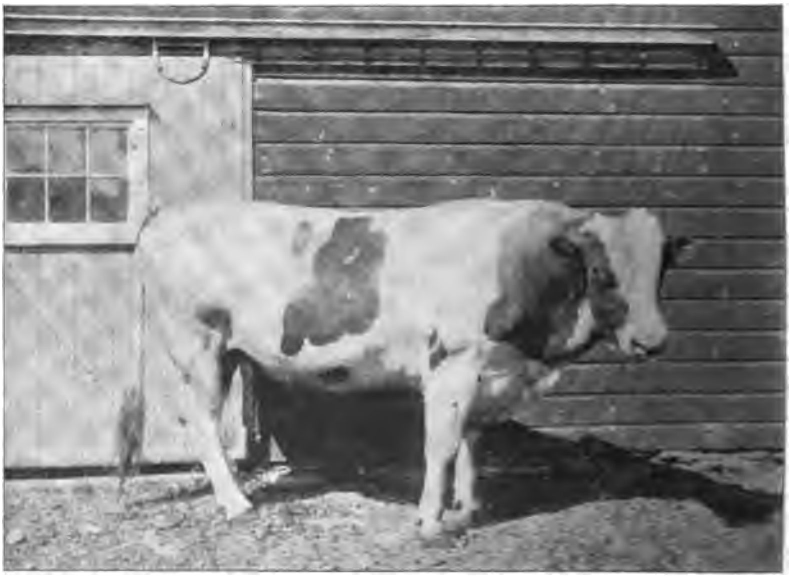
providing of small experimental farms in connection with such schools, and the development of every public institution farm as an experimental farm for the community in which it is located. The first part of this work is carried on under the supervision of the Department of Education and the latter under the guidance of the Department of Agriculture.

Agricultural education in the Empire State begins, as it should, on the farm. In the State, at present, there are forty-eight high schools maintaining four-year courses in agriculture. Over 1,000 pupils were enrolled in these courses last year. The most expensively equipped of these schools has less than $1,000 invested in apparatus and appliances, and the herds, barns, flocks and machinery of neighboring farmers are almost universally offered for laboratory use. Within the year there will come into existence a school plan comprehending a widened and broadened idea of this phase of education. This is the community public school, which will not only serve as a teaching agency but will have under its roof other agricultural educational facilities, such as the office of the county farm bureau manager, an audience room to be used as a community center, a library for general agricultural educational purposes, and other instruments for placing better and broader educational facilities close to the farm.

As the next step in agricultural education, there are now in the Empire State six secondary agricultural schools. These are

Soy Beans are Grown as a Cover Crop by this New York Farmer located with reference to geographical position, one being in St. Lawrence county, another in Allegany county, a third in Madison county, another on Long Island, a fifth in Delaware county and the sixth in Schoharie county. The first three of these schools are in active operation; the next two will open their courses in September, 1915, and at the sixth buildings are rapidly nearing completion. Young men and women may equip themselves in these schools for the work on the farm, and the greater proportion of the students find their way directly back to the farm.

The third and final step in education is found in the State College of Agriculture at Cornell University. As for the standard of the College, it only needs be said that its enrollment of students is higher than in any other college of the University and that its graduates are found throughout the world on the faculties of agricultural educational institutions



This Holstein Bull Heads a Prize Herd in Columbia County

Court Houses are Beautiful Structures Set in Spacious Grounds

and as leaders in practical farm development. As a college of agriculture, this State institution is acknowledged to be without equal anywhere in this United States.

As one of the most important agencies for agricultural education in the Empire State, there is the Experiment Station. The station was established for " investigation and experimentation concerning agricultural problems." Its head, Dr. W. H. Jordan, has done much to make this institution of the first rank among the experiment stations of the states. Its publications

Sheep Return Good Profits for Many Herdsmen in New York State

go into all farm homes requesting them, and represent the last word in the solving of those problems which the individual farmer cannot solve.

Through the Department of Agriculture, the State is doing much for the welfare of the farmer. Primarily a regulatory agency, it is the policy of the State to make the Department more and more an educational agency, and through its farmers' institutes and publications it takes the story of better agriculture to the farm. The supervision of county and town agricultural societies is lodged with the Department of Agriculture and through an annual appropriation of $250,000 an effort is made to develop more and more the benefits which must result from such community gatherings.

Through the county farm bureaus, the Empire State is getting closer and closer to the individual farmer. This work, carried on in cooperation with the Federal government, now extends into nearly one-half the counties of the State. One reason why the farm bureau is such an important factor is because it is managed and largely financed by local men who understand and appreciate local wants and needs.

The use of public institution farms as experimental farms has resulted in further bringing the farmer into intimate touch with the State agricultural educational facilities. There are close to fifty farms connected with the State hospitals and various correctional and charitable institutions. Under the supervision of the Department of Agriculture these farms have been brought to a high degree of productivity, and each stands

New York State College of Agriculture at Cornell University.

Top, Main building; Left to right, Forestry building, Bailey Hall, Home Economics building, Greenhouses, Farm Management building, Barns, Animal Husbandry building, Caldwell Hall, Poultry building.

Cucumbers are Grown by Long Island Truck Farmers for Market

as an example of better farming in its community. The same development has been carried to the county almshouse farms and these institutions are rapidly being brought to the high standard necessary to profitable farming.

Other agencies utilized by the Empire State number more than a score. There are cow testing associations, cooperative buying and marketing organizations, the rural press and various minor institutions, all of which lend themselves to the development of the big general scheme. There never was a time in the Empire State when agriculture received such intelligent attention as now; there never was a time when agriculture was making such wonderful progress as now, and there never was a time when opportunity knocked louder at a man's door than now, with agricultural land purchasable at such low prices.

Reapers in Batteries of Three are Used on this Business Farm

PROSPERITY AND THE FARM

Agriculture is the foundation industry. Fifty-four per cent of the inhabitants of this United States are classified as rural. Twenty-one per cent of the inhabitants of the Empire State are classified as rural. When such a large number of people are prosperous, all other industries feel the good effect. It is a common saying that in a year of good crops our country enjoys prosperity.

An increase of only one bushel of grain per acre, or its equivalent, on all improved agricultural land in the Empire State would require nearly 3,000 extra trains of fifty cars each for transportation. It is easy to see what this would mean to business—the stimulus being transmitted from one industry to another, until it covered the entire State and affected practically every person.

The great question is how to feed the increasing population. The farm, somewhere, must be depended upon to supply the foodstuffs for more than one-third the population of the whole United States, massed within twelve hours by train of any Empire State farm. The answer is in our farms, with

Hundreds of Farmers Sell Truck Crops in Albany Market Square

their fertile acres containing an asset of almost untold wealth. It is inevitable that, with the rapid growth in population of cities, towns and manufacturing centers, every acre of available land in the Empire State will be compelled to contribute its full share to the demands made by home markets.

The wisdom of the men who take early advantage of the prevailing low prices of farm lands in our State will be amply rewarded. So many lines of effort offer themselves that there cannot be a farmer anywhere whose experience will stand him other than in good stead in the cultivation and improvement of an Empire State farm.

The Empire State ranks first among all the states and territories in the production of hay, all dairy products, potatoes, beans, buckwheat, farm forest products, vegetables, apples, small fruits, flowers and plants, nursery products, hops and onions. It ranks second in orchard products and grapes, fourth in rye, sixth in oats, eighth in animals slaughtered, ninth in barley, thirteenth in wool, fourteenth in animals sold, twenty-second in wheat and twenty-fifth in corn. It should be noted, in considering the position of our State in regard to the production of rye, oats, barley, wool, wheat and corn that

Spinach is a Truck Crop Returning Profit to Genesee Farmers

the states holding first rank in these products range from 5,000,000 to 35,000,000 acres greater in extent than New York State and that her position is, therefore, relatively high.

A comparison of the average crops of corn, oats, hay and potatoes, taken from the Federal government report for 1914, shows conclusively the great fertility of the soil of the Empire State, as the average crops in quantity are equal to or greater than those of the great grain producing states, and very much greater in value owing to the home markets with which our farmer is surrounded. The average value of the crops of corn, oats, hay and potatoes in this State exceed the average of Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Nebraska and Kansas by $10.61 per acre, while that of corn alone exceeds the average of the next highest state by $7.09 per acre.

The Federal reports for 1914 indicate that the value of all crops, including dairy products and live stock, sold from the

Beautiful Streams Offer Inducements for Summer Diversions

Lettuce for Early Markets in Rows as Far as the Eye Can Reach

farms of the Empire State exceed $440,000,000, or an income equal to about $28.00 an acre for the improved farm lands of the State. The value of the hay crop for 1914 exceeded $80,000,000. Dairy products amounted to about the same figure. The apple crop of 1914 approached 50,000,000 bushels. The four leading apple counties in the United States are Monroe, Niagara, Wayne and Orleans, in the order named, of the Empire State. These four counties produce more apples than any four states in the Middle West. The five greatest dairy counties are Empire State counties. St. Lawrence has more dairy cows than any other county in the United States, with Delaware, Oneida, Jefferson and Cattaraugus ranking next in the order named.

According to the Federal government report for 1915, based upon crop conditions on July 1, the Empire State will produce 20,800,000 bushels of apples, or about seventeen per

Empire State Wheat Fields are Heavy With Grain at the Harvest

cent of the total production for the whole United States. The potato crop will total about 36,300,000 bushels, or one-tenth the entire production of the United States. The production of wheat will run nearly 2,000,000 more than the average for the last five years. The 1915 crop is estimated at 8,200,000 bushels. Corn in the Empire State, according to the Federal authorities, will yield 20,000,000 bushels in 1915. The tobacco crop will total about 5,465,000 pounds.

Based upon the Federal government report for 1914 crop productions and values, the Empire State holds an enviable position. In corn, the average production per acre was 41 bushels, as against an average for the United States of 25 bushels. The value was eighty-one cents a bushel as against an average of sixty-three cents for the whole country. In wheat, New York's average production was 22.5 bushels as against 16.6 for the United States, while the average value exceeded that of the country as a whole by nearly ten cents a bushel.

New York State Farm Housewives Like to Drive Over Good Roads

Potatoes averaged in the Empire State, 145 bushels per acre, as against an average for the country as a whole of 109.5 bushels. Rye averaged 17.7 bushels per acre, as against 16.8 bushels for the United States. Oats ran 31.5 bushels to the acre, on an average, as against 29.7 bushels for the whole country. Barley averaged 28.0 bushels as against 25.8 bushels per acre for the United States. Buckwheat ran 23.0 bushels per acre, as against 21.3 for the whole country.

Some idea of the enormous crops grown in the Empire State may be gleaned from the fact that the 1914 hay crop was more than that of the six New England states, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and

Tobacco is a Valuable Crop in Several Sections of the State

A Second Cutting of Alfalfa in the Empire State on July 20th

Alfalfa is rapidly becoming one of the important hay crops in New York State. The soil in many sections of the State is particularly adapted to the crop and shipments are increasing rapidly every year

Connecticut, with Florida, Maryland, North and South Carolina thrown in for good measure. The Empire State produces more potatoes than California, Oregon, Washington, Idaho, Nevada, Arizona, Utah, New Mexico, Colorado, Wyoming and Montana combined. Her apple crop is more than that of all the states west of the Mississippi.

Dairying and stock raising are important industries in the Empire State. The soil is especially adapted to the growing of grasses suitable for the grazing of live stock. When it is realized that fresh beef, veal, mutton, lamb and pork, to a total value of over $17,000,000, was imported by the United States in the year ending June 30, 1914, it would appear that an investment in the farm lands of the Empire State at present prices could be made advantageously, with a view of entering the fresh meat industry. In this connection it should be noted that the stock yards at East Buffalo are the second largest in the world, with the result that Buffalo is the best eastern accumulating and distributing point for stock.

The Empire State dairyman grows a large acreage of corn for ensilage, as well as many other forage crops. Ensilage corn usually runs ten to twenty tons to the acre. The average price for milk is between three and four cents a quart, and receiving stations dot the State. The average haul of milk from the farm to the milk station is less than two miles over improved highways, and in many sections the milk is bought on the farm, haul being obviated.

Young cows for the dairy have been selling in various parts of the State at from $60 to $100 each. The farmer with foresight in the Empire State makes his dairy self-perpetuating

Oats and Peas are Grown as a Forage Crop on This Dairy Farm

and clears a handsome profit through the sale of veals and surplus young stock. Our sheep number about 500,000, when fifty years ago the number was nearly 5,000,000. The low price of wool and mutton for many years made this industry unprofitable, but now the tide is turning back. Hogs can be raised in this as economically as in any other part of the country, and prices for pork products are always good. Poultry raising is profitably carried on in the Empire State. Every fowl finds a market at twenty cents each above the average of the central western states, and eggs are usually five to ten cents a dozen more.

Alfalfa is rapidly becoming one of the important crops of the Empire State. Several counties show gains in acreage of fifty to seventy-five per cent over the previous year. Numerous counties have more than 5,000 acres each in alfalfa, from which three crops of about a total of five tons per acre are cut. Figures from the New York Central railroad station at Manlius, a village of 1,500 inhabitants in Onondaga county, show that receipts from the shipment of farm produce doubled in the last year.

New York State Grapes are Noted for Their Wonderful Flavor

"One of the reasons for the large gain in monthly receipts," says the official report, "is that this part of the country is raising a much larger quantity of alfalfa than ever before and the demand exceeds the supply. Much of the alfalfa is shipped some distance. It is believed that within a very few years alfalfa will be the chief product of this section of the State."

Illustrating what is done every day on Empire State farms, the Department presents brief statements of individual yields of various farm crops. The actual products cited were exhibited at the Panama-Pacific International Exposition, San Francisco, California, where they were awarded one medal of honor, thirteen gold medals, twenty-five silver medals and twenty-one bronze medals, as well as two mentions of honor. The following products, picked at random from Empire State farms, won these high awards in competition with the world, and exemplify the results of good farming in the State.

Corn. Raised in Oswego county. Yield, ninety-three bushels of ears per acre; value on the farm, seventy cents a bushel. A similar farm would be valued at $50 to $75 an acre. All of the Empire State corn crop is manufactured into dairy or live stock products on the farm. In this form it can most cheaply and profitably be carried to market. It costs, on the average, less than three-quarters of a cent a quart to take milk to New York City; three-tenths of a cent a pound for butter,

A Business Farm in Chenango Making Money for Its Owner

A Hereford Bull Bespeaking Quality of Breed in New York State

while hogs can be taken from central points to New York City for $38.50 per double-deck car.

Oats. Raised in Monroe county. Yield, ninety bushels per acre; value on the farm, forty-nine cents per bushel. The Federal report places the value of land in Monroe county at from $75 to $100 an acre; the best farms, of course, are worth more. The local market generally absorbs the crop, but it can be hauled over macadam roads and shipped to New York City for six cents a bushel, or a fraction of this on the barge canal.

Wheat. Raised in Onondaga county. Yield, forty-seven bushels per acre; value on the farm, ninety cents per bushel. Similar farms can be purchased for $75 to $100 an acre. The crop can be placed at the seaboard for six cents a bushel by railroad, or a fraction of this cost by barge canal. Forty-five bushels per acre at ninety-seven cents a bushel equals $30.36, the value of a crop on land valued at $75 an acre.

Barley. Raised in Cayuga county. Yield, fifty-five bushels per acre; value on the farm, seventy-five cents per bushel. The best farms in this section are valued at $75 to $100 per acre. Transportation costs six cents per bushel to seaboard by railroad, or much less by barge canal. Fifty-five bushels per

Beef Cattle are Produced With Profit by Empire State Farmers

Beans Bring Good Returns in Many Sections of New York State

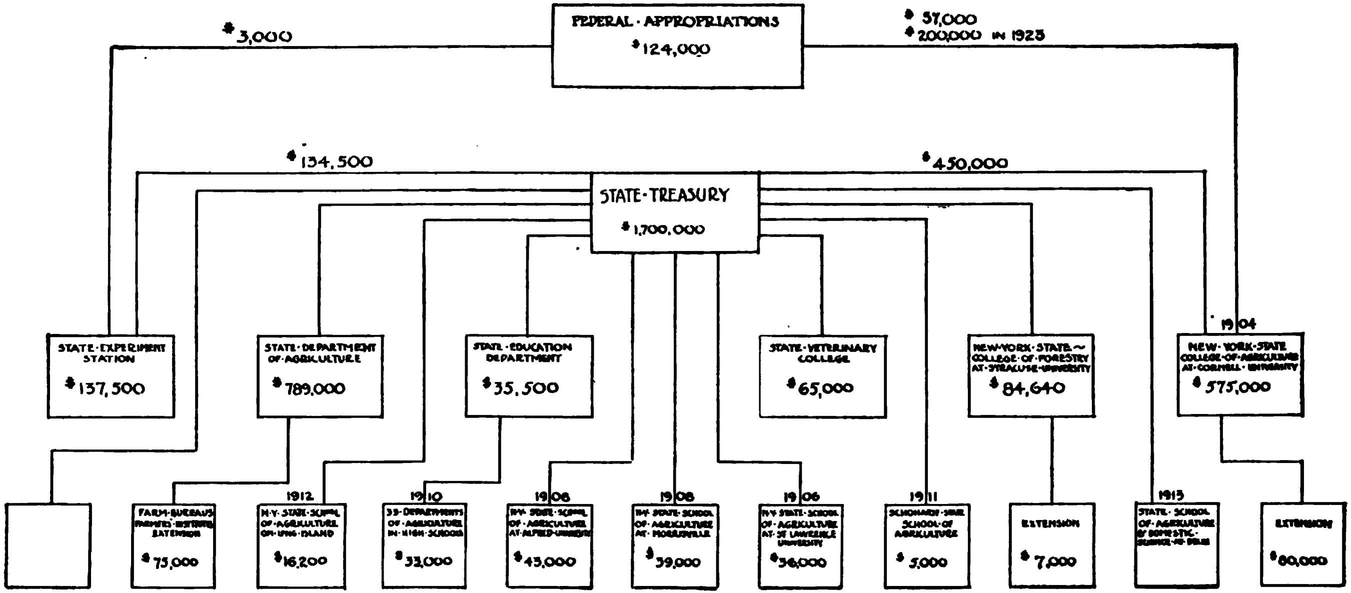
acre at seventy-five cents a bushel equals $41.25, the value of a crop on $75-an-acre land.

Rye. Raised in Columbia county. Yield, forty bushels per acre; value on the farm eighty cents a bushel. Similar farms are valued at $25 to $50 an acre. Forty bushels per acre at eighty cents a bushel equals $32, the value of the crop on $50 land.

Buckwheat. Raised in Montgomery county. Yield, twenty-four and one-half bushels per acre; value on the farm, sixty-

This Cooperative Creamery makes 600 Pounds of Butter a Day

APPROPRIATIONS · FOR · AGRICULTURE · IN · THE STATE · OF · NEW · YORK


FEDERAL · APPROPRIATIONS
$124,000
$3,000
$57,000
$200,000 IN 1923
STATE · TREASURY
$1,700,000
$134,500
$450,000
STATE · EXPERIMENT STATION
$137,500
STATE · DEPARTMENT OF · AGRICULTURE
$789,000
STATE · EDUCATION DEPARTMENT
$35,500
STATE · VETERINARY COLLEGE
$65,000
NEW · YORK · STATE ~ COLLEGE · OF · FORESTRY AT · SYRACUSE · UNIVERSITY
$84,640
1904
NEW · YORK · STATE COLLEGE · OF · AGRICULTURE AT · CORNELL · UNIVERSITY
$575,000
FARM · BUREAUS FARMERS · INSTITUTE EXTENSION
$75,000
1912
N · Y · STATE · SCHOOL OF · AGRICULTURE ON · LONG · ISLAND
$16,200
1910
33 · DEPARTMENTS OF · AGRICULTURE IN · HIGH · SCHOOLS
$33,000
1908
N · Y · STATE · SCHOOL OF · AGRICULTURE AT · ALFRED · UNIVERSITY
$43,000
1908
N · Y · STATE · SCHOOL OF · AGRICULTURE AT · MORRISVILLE
$39,000
1906
N · Y · STATE · SCHOOL OF · AGRICULTURE AT · ST LAWRENCE UNIVERSITY
$36,000
1911
SCHOHARIE · STATE SCHOOL · OF AGRICULTURE
$5,000
EXTENSION
$7,000
1913
STATE · SCHOOL OF · AGRICULTURE & DOMESTIC · SCIENCE · AT · DELHI
EXTENSION
$80,000

seven and one-third cents a bushel. Similar land is valued at $25 to $50 an acre. Twenty-four and one-half bushels per acre at sixty-seven and one-third cents a bushel equals $16.46, the value of a crop on $25 land.

Beans. Raised in Oswego county. Yield, Marrow, twenty-four bushels to the acre; Imperials, twenty-three and one-fourth bushels per acre; value on the farm, $3.75 to $4.00 a bushel. This farm of 200 acres was purchased for $55 an acre. Cost of transportation to the seaboard on beans is six cents a bushel by rail, less by canal.

Potatoes. Raised in Onondaga county. Yield, 393 bushels per acre; value on the farm, fifty-nine cents a bushel. Equally productive land is valued at $75 to $125 an acre. The freight rate on potatoes to New York City averages nine cents a bushel.

Hay. (Alfalfa) Raised in Onondaga county. Yield, four tons per acre; value, $19 to $25 a ton f. o. b. Farm land producing such crops can be purchased for $50 to $125 an acre. Four tons of alfalfa at $19 a ton equals $76, the value of the crop produced on $100 land.

(Timothy) Raised in Columbia county. Yield, three tons per acre; value, $18 to $22 a ton, f. o. b. This crop was secured from a typical "run-down" farm of which the most valuable asset, when purchased, was a barn in the poorest condition. Three tons of timothy at $18 per ton equals $56, the value of the crop grown on land which can be purchased for from $20 to $30 an acre.

THE MEAT OF THE KERNEL

If it is true, as repeatedly stated by this Department, that in the Empire State there await the homeseeker the greatest agricultural opportunities in the United States today, why is it that farm lands can be purchased so cheaply? If it is true that the Empire State farmer averages greater crops per acre, the average value of which crops is higher than in the West, why are Empire State farm lands for sale at any price?

Empire State farm lands are relatively cheap for four reasons, as follows:

First. The distribution of the public domain, which started with the passage by Congress of the Homestead Act authorizing the free distribution of quarter-sections of land to practically all comers, caused for years an unending procession of farmers from the East to the West. Succeeding, these farmers drew new recruits from the East.

Second. The financial rewards offered by our many cities through the development and expansion of all lines of commerce and manufacturing, have attracted our farmers' sons and daughters more powerfully than in any of our sister states.

These opportunities have been greater than elsewhere and they have been exhibited closer to the farm.

Third. The very prosperity of our New York State farmers, evidenced by the fact that the percentage of mortgage indebtedness on our farms is lower than that of almost any other state, has helped to depopulate our farm lands of the actual owners because they have retired from their farms to enjoy the easier life of the cities and villages. The farms so left, in numbers greater than the demand, have always been a check upon any appreciable rise in farm values.

Fourth. For many years after the public domain had been largely distributed, the value of farm products was often lower than the cost of production on the higher priced eastern farms. Farming in the East ceased to be profitable, and consequently values of farm lands depreciated rapidly until the growth of population increased to such an extent as to cause the demand to exceed the supply of farm products.

The majority of farms listed with the Department of Agriculture as for sale, are upon the market because of the advanced age, ill health or death of the owner, the settlement of estates or the wish of the owner to remove from his farm to a quieter

An Empire State Home on a Profitable Chenango County Farm

Raspberries are a Money-Making Crop for Many Truck Farmers

and easier life in some near-by village. In some instances prime farms come upon the market because the owner finds himself unable, under existing labor conditions, to farm a large acreage, and so divides a farm of 300 or 400 acres into two farms, the smaller of which he will farm for himself and the larger he will offer for sale.

The phenomenal growth of business enterprises in the Empire State has fascinated the farm boys and won them by thousands away from the farm. Year after year the brightest and best of our young men and women have been leaving the farm for the allurements and supposed greater opportunities of the town and city. Today, while their exodus has been lessened and we are hearing something of the cry, "Back to the farm," there are many farmers who are not pursuing the system of agriculture they would desire because they have not the labor necessary to carry out their plans.

This Country Church is in a Village of Only 1,500 Inhabitants

The places of those leaving the farms have not been taken until late years by the great number of immigrants coming to our shores. The West, through attractive advertisements and favorable terms, induced these foreigners to settle there, whereas if the immigrants had known of the splendid possibilities existing in soil from two to six hours' ride from where they landed, they would undoubtedly have selected it in preference to that so far away.

At this time, not only are numbers of immigrants settling in the Empire State within a few days after landing in New York City, but large numbers are giving up leased lands or farms which they have purchased in the West and are joining the eastern tide. During the year of 1914, the Department of Agriculture acted as intermediary in the sale of farm land to the value of more than $1,000,000, of which a considerable amount was purchased by foreigners or newly-made American citizens.

In the fall of 1914, the Empire State undertook to place a first-hand view of her agricultural advantages before the Middle West. An everyday exhibit of agricultural products was gathered from various sections of the State and an

This Hall was Given to a New York Village by a Retired Farmer

Percheron Mares Combine Utility and Beauty on this Farm

agricultural exhibit train journeyed into three of the middle western states. During a period of six weeks, more than 15,000 people passed through the train. Officials of the Department of Agriculture accompanying the exhibit, in conversation with visitors to the exhibit, gathered some interesting facts.

The case of a young foreigner who entered the car at a point in Indiana may be cited. This man looked to be a prosperous farmer, as indeed he was, and some surprise was expressed that a well-to-do farmer, married and having a family, comfortably settled in the West, should want to come east. The man's story was simple. He had landed at Ellis Island some eight or ten years ago with the savings of some years in the old country. When he asked the immigration officials where to locate, they could not help him. A railroad man secured his attention, painted a glowing picture of the fortunes to be won in the Middle West, and sold the man a ticket for Indiana.

This foreigner landed in Indiana and looked about. His

New York Farmers are Fast Becoming Breeders of Draft Horses savings would not purchase five acres of land. He knew no one and could not secure money with which to handle a larger proposition. Like many others, he became a renter. He netted a comfortable living and saved something each year. But his condition, so far as becoming an owner of land, never bettered, for land increased in value faster than he could save.

This man's position is typical of the position of thousands of farmers in the West. He is unable to purchase a farm because he cannot finance the proposition. On an average valuation of $200 an acre, a man buying a half-section has to face the problem of financing a $16,000 proposition. Most of this land can be bought on a fifty per cent mortgage basis, but even then the prospective buyer has to look for $8,000, the interest upon which will be six per cent or more, or at least $480 a year.

The assertion that farm land in the West is held at too high a valuation to make for advancement is only half the truth. The facts are that not only is the land held at a tremendously inflated value, but that the farmers themselves admit it. It is a fact that western farmers are making money; their bank balances show it and their fields show careful and expert

Poland China Swine Have Proved Profitable for Many Hog Raisers

cultivation. The question is whether the western farmer is making money on his investment. That is quite another proposition. According to the statements of western farmers made to the officials of the Department of Agriculture, the number making more than two or three per cent upon a valuation of $200 to $250 an acre is very small.

Every national land movement resembles a tide. Ever since Horace Greeley preached, "Go west, young man," the tradition has been that the West, rather than the East, was the region of cheap land and farming opportunity. The tradition has outlived the fact. The tide has turned, and inquiries come in from the West by the score as to farm lands for sale here. This wave is bound to increase largely, for it is a fact that the East rather than the West is now the place of cheap land and agricultural opportunity.

What the Empire State desires, is that the western farmer, if he finds himself unable to handle the heavy financial proposition incumbent upon the purchase of a farm in his section — if he has decided to move to some other section of the country in the effort to better himself — then the Empire State wants him to realize the great agricultural opportunities here. The Empire State wants the best farmer on the best farm adapted to his purposes and will bend every effort to aid the western farmer in this direction if he comes East.

The Empire State argument is business-like. It is that land can be purchased here at from $20 to $125 an acre which will show larger and more stable profits than land of the same quality in the West or Northwest valued at twice and thrice the amount; that transportation facilities cannot be equaled anywhere in the United States; that the climate is better suited to general farming than that of the Far West or Canada; that the Department of Agriculture stands ready to serve the farmer in every way; that state laws protect him against fraud; and that, generally, the Empire State is truly a part of God's country.

A Shorthorn Bull Heading a Prize Herd on an Empire State Farm

OPPORTUNITY KNOCKS BUT ONCE

With a view of placing before the homeseeker in specific form the agricultural advantages of the Empire State, the Department of Agriculture presents descriptions of ten typical farms of the State which may be purchased at relatively low prices. These farms have been selected as representative of the State; they comprehend practically every section of the State and show the adaptation of the soil to widely different crops.

In accordance with the established practice of the Department to lend favor to no section or individual, location of the farms cited is restricted to the county in which they are located. The names of owners are withheld for obvious reasons. The annual publication of the Department, "Farms for Sale or Rent in the Empire State," lists all farms for sale, together with locations, descriptions and owners' names; this publication may be secured upon application to the Department.

The first is a farm of ninety-five acres, in Albany county, five miles from an enterprising village on the Delaware and Hudson railroad. It is close to a small village with a good

The York State Farm Housewife Takes Pleasure With Her Flowers

school, churches and stores, and close to improved highways. The land is level, very fertile, easily tilled, adapted to the raising of alfalfa, timothy, corn, wheat, oats, barley, hay, potatoes and other crops, and is good fruit land. There is an eight-room house in good repair; a large barn, substantially built and in good condition. This farm can be purchased for $3,200. This is a sample of small farms in this section, in every way desirable and for sale at very low prices.

The second is a farm of 250 acres of rich limestone soil in a high state of cultivation on the shore of Cayuga Lake in Central New York. The farm is slightly rolling toward the lake, sufficiently so to insure good drainage. It is one-half mile from railroad station and barge canal landing in a beautiful village, with school, churches and commercial establishments, and nine miles from a city of 30,000 population, connected with new improved highway. The soil of this farm is particularly adapted to the raising of hay, alfalfa and other

Many Farmers Find Chickens a Profitable Adjunct to the Farm

Plowing With a Tractor is the Rule on This North Country Farm

clovers, wheat, corn, barley, oats and fruit. The growing crops are estimated to be worth over $5,000. The buildings are in excellent condition. The main house and barn are of cut stone and cost about $60,000 to build. There are two other houses on the farm — one of eight and the other of ten rooms; two barns, each 40 by 100 feet in size, and all other outbuildings necessary. This is an excellent grain, stock or dairy farm. It may be purchased with one-half the growing crops for $32,500; $10,000 cash and the balance on easy terms.

The third is a farm of seventy acres in Cattaraugus county. This farm is three miles from a thriving hamlet; a city of about 10,000 inhabitants is five miles distant over a good highway, and is a center for three railroads. There is a school within forty rods of this farm, with butter factory, cheese factory and milk station within easy distance and churches near by. The farm is rolling in character, with thirty acres in meadow and forty acres in pasture. It is best adapted to corn, oats and hay. There is a house of nine rooms in good repair, a basement barn, 42 by 42 feet, nearly new; corn crib, granary and other outbuildings. Fences are of wire, all in

York State Farmers Use the Most Improved Machinery Available

Fifteen Thousand People of the Middle West Saw This Exhibit of Empire State Farm Products

Many of the Middle West farmers who heard the story of agricultural opportunity from this exhibition train are now good condition; house and barn are watered by wells and the fields by springs. This farm, together with two horses, seven cows and all farming tools, can be purchased for $3,500, on account of the advanced age of the owner.

The fourth is a farm of 116 acres, located in Ulster county, in the Hudson River section. This farm is two miles from a beautiful village of 1,250 inhabitants, which is located on a railroad and running to which are a fine gravel highway and an electric trolley system. Schools, churches, good stores and milk station are found in this village. The farm is level and the soil is a rich loam. There are eighty-five acres in meadow, twenty acres in pasture, six acres in oak and chestnut timber, and five acres of fruit. It is best adapted to hay, corn, oats, rye and fruit. There is an attractive house of twelve rooms in good repair, a large barn, carriage house, milk house, silo, ice house and other outbuildings — all in good condition. Fences are in good condition and the entire farm is watered by wells and springs. This farm, together with eighteen head of cattle, two horses, pigs, poultry, all farm machinery, implements and growing crops, can be purchased for $8,500; $4,500 cash and the balance on mortgage.

The Best Horses in the Country are Raised on this Stock Farm

The fifth is a farm of 350 acres in Erie county six miles from postoffice and railroad station, on the Buffalo, Rochester and Pittsburg railroad. Schools and churches are one mile distant and milk is sold on the farm. A good highway passes the farm and improved macadam road is one mile distant. The farm is level and the soil is a dark loam with clay subsoil. There are one hundred acres in meadow, one hundred acres in pasture, ten acres in timber, eight acres of apples and fifteen acres of pears, plums and cherries. This farm is best adapted to the raising of corn, oats, hay, rye, buckwheat and wheat. There is a house of thirty rooms, beautifully finished; two farm houses — one of twelve and the other of seven rooms; a recreation hall 40 by 100 feet in size; a cow barn 48 by 208 feet in size; horse barn 40 by 100 feet, and other outbuildings. House, barns and fields are watered by tank supplied by windmill. This farm can be purchased, together with all stock, fodder, growing crops, farm machinery and implements, furniture of houses, sixty cows and seven horses for $40,000; $20,000 down and the balance at six per cent interest, long term mortgage.

Children From Four Districts Attend This Modern Rural School

The sixth is a farm of 200 acres, located in Albany county, one and one-half miles from postoffice and four and one-half miles from station on the Delaware and Hudson railroad, in the heart of a noted summer resort section. Schools, churches and good stores are one and one-half miles distant, and a butter factory three miles distant, over good roads. This farm is level and rolling, the soil a limestone and loam. There are sixty acres in meadow, twenty-five in pasture, ten acres in rye, fifteen in hemlock and other timber. There are fifty apple trees on this farm, as well as pear trees, currant bushes and other fruits. It is best adapted to alfalfa, hay, oats, rye, buckwheat, corn and potatoes. There is a house of twenty rooms, a main barn 40 by 54 feet, a hay barn 36 by 42 feet, a carriage house 20 by 40 feet, a hen house 24 by 50 feet, hog house and other outbuildings. The farm is watered by wells, ponds, springs and cisterns. It is four miles from two large summer resorts, and an ample market for summer foodstuffs is thus within easy reach. This farm can be purchased for $4,000; $1,500 down and the balance on mortgage.

The seventh is a farm of 130 acres, located in Ontario county, three and one-half miles from postoffice and seven and one-half miles from Lehigh Valley railroad station. This farm is one-half mile from a good school and three and one-half miles from churches and stores. Eleven miles distant, over a good highway, is a city of 7,500 inhabitants. This farm is rolling, partly hilly, and the soil a gravelly loam. There are forty-five acres in meadow, thirty acres in pasture, four acres of apples and four acres of raspberries. There is a house of ten rooms in good condition, and a practically new farm house of six rooms; also a good grain barn and usual outbuildings. The farm is watered by wells, spring and cistern. This farm can be purchased for $26 an acre; one-half down and the balance at five per cent. This farm may also be rented.

The eighth is a farm of eighty-nine acres, located in Clinton county, one and one-half miles from postoffice and railroad station of the Delaware and Hudson. School, churches and stores are one-half mile distant. Seven miles distant, over a

Eggs by Parcel Post to the Buyer's Table Bring Good Profits

good highway, is a thriving city of 12,000 inhabitants. The surface of this farm is rolling and the soil clay, loam and sand. There are fifty acres in meadow, twenty-five in pasture, and fourteen acres of pine, white birch and other timber. There is a house, main part 26 by 36 feet and a wing 26 by 20, in fair condition; two barns, each 30 by 40 feet in size, and two sheds — all in good condition. The farm is watered by brook and wells. This farm may be purchased for $4,000; $2,000 down and the balance on easy terms. If preferred, it may be rented with option to buy.

The ninth is a farm of 230 acres, in Otsego county, four miles from postoffice, butter factory, cheese factory, milk station, churches and mercantile establishments, in an attractive village of 300 inhabitants, on an interurban trolley system. Twelve miles distant over good highways and trolley is a bustling city of 10,000 inhabitants, where is located one of the Empire State's normal training schools for teachers. The farm is gently rolling in character and the soil is a clay loam. There are seventy acres in meadow, one hundred acres in pasture, sixty acres in hemlock and hardwood timber, and sixty apple trees. This farm is best adapted to the raising of hay, grain and potatoes. There are two miles of woven wire fence in prime condition, and other fences are good. There are two good frame houses, a barn, 25 by 100 feet in size, in fair condition, and other outbuildings. The house is watered by well, fields by brooks. This farm can be purchased for $2,900; $1,000 down and the balance on easy terms.

The Empire State Leads All States in the Production of Hay; the 1913 Crop was Over 5,275,000 Tons

New York State hay averages from $1.75 to $2.35 per ton more than the hay of Ohio, Indiana or Illinois. The Federal valuation for 1915 is from $3.00 to $4.00 a ton higher than in the states named and $7.00 to $8.00 higher than in the Dakotas, Kansas and Nebraska

The tenth is a farm of 170 acres, a few miles south of Albany, the Capital of the State and a commercial, industrial and educational center. Schools, churches and stores are within one and one-half miles of this farm; railroad station, cheese factory and milk station are within easy distance. Improved state highway passes the farm. The farm is smooth and slightly rolling in character, sloping to the east. The soil is a fertile loam. There are one hundred and sixty acres in meadow and ten acres in pine, hemlock, elm and ash timber. This farm is best adapted to the raising of alfalfa, wheat, red clover, hay, oats, corn, buckwheat and potatoes. Fences are in good condition and the entire farm is well watered. There is a house 24 by 64 feet in size with small buildings attached; a barn, 22 by 70 feet; carriage house, 26 by 40 feet; sheep house, 20 by 30 feet; also ice house, hog house, hen house, machinery house and other outbuildings. This farm can be purchased for $6,000, because of the ill health of the owner; part cash, and the balance on easy terms.

THE PROOF OF THE PUDDING

"The proof of the pudding is in the eating;" so runs an ancient proverb, and in no line of endeavor is it more applicable than in agriculture. The claims of the Empire State for the agricultural opportunities within her borders count for nothing if actual experience fails to prove her contentions. Statistics, exhibits, photographs — all count for little unless back of every figure, every exhibit and every photograph is proof of performance.

There are in the Empire State farmers who, through unusual ability and foresight, and backed, perhaps, with unusual amounts of capital, are reaping exceptional harvests with unusual profits. There are such farmers in every state. But their accomplishments have little bearing upon the matter, because those accomplishments are exceptional and unusual. What must be the important thing with the prospective settler in the Empire State is the average performance of average farmers.

But here it might be argued that the western farmer, unfamiliar with eastern conditions, might not be able to equal the records of even the great body of farmers who are neither exceptionally good nor poor tillers of the soil. There is a large and growing body of farmers in the Empire State who can give the conclusive argument — the answer which cannot be controverted or attacked — to this question. It is the stories of these men — farmers whose residence in the Empire State is limited, at the most, to a very few years — which the State presents.

The letters which follow are the voluntary statements of men who, discontented with conditions in the West, have come to the Empire State, sought the aid of the Department of Agriculture in locating themselves, and are living upon farms purchased with the advice of the Department. The first is a letter from a Swedish farmer who came to the Empire State from Nebraska and purchased a farm in Seneca county. He writes to the Department of Agriculture as follows:

I had no intention of moving to New York, until, on account of my father's sickness last summer, I came here for the first time. My father and two brothers had been here several times and had also made trips through several sections of the State under the guidance of the Department of Agriculture at Albany. They had expressed themselves most favorably regarding farming conditions and opportunities here, but I felt as if it would be of no interest to me and rather discouraged them from the thought of making any investments here.

It was this first visit which caused me to get interested in New York lands. I certainly could not help becoming impressed with the good market conditions, the reasonable price for excellent lands, with fine buildings, and the great crops raised by those who farmed with reasonable intelligence and

Quiet Streams Wind in Lazy Curves Between the Shelving Banks

took care of their lands so that there was something to give back for what was taken off.

I also found very good roads and a most beautiful country, which all made me decide quickly to go back to Nebraska and dispose of what property I had there, whereafter I purchased 120 acres here in Seneca county, on the banks of Cayuga lake, seven miles south of Seneca Falls — a pretty town of 7,000 inhabitants.

I have found everything fully up to my expectations and am more than satisfied. I do not believe any of my family could be induced to go back to Nebraska after once having lived here. We certainly feel at home and only hope that many of our western friends will soon follow our example, which we have good reason to expect. Hundreds of Westerners are kept away from the East only because they have no report about conditions from people in whose judgment they can trust.

In regard to land and market conditions, I wish to mention a few things which have occurred to me. I felt that one thing to do on these New York State lands was to get stock of some kind, so I bought cows and hogs, also poultry and horses. We decided to put a first-class article of butter on the market, and we found no difficulty in getting thirty-six to thirty-eight cents per pound right at Seneca Falls for all we could produce during the winter; now, in June, we are getting thirty cents, and have a full line of customers and could get more at these figures.

In April we sold some one-year-old hens at $1.17 each and eggs during the winter went as high as sixty cents a dozen, while today's market here is twenty-two cents a dozen. Wheat today is being bought at the mill at Waterloo at $1.05 a bushel; hay was sold last week by one of my neighbors at $17.50 a ton, f. o. b. Seneca Falls in carload lots, the buyer to pay for baling. The average price for good hay last winter was $1.50 a ton lower than the above price. Oats are selling here now at fifty-five cents a bushel. I just mentioned these prices to show that no place but New York could pay them; we certainly are surrounded with the very choicest markets.

Many Western Farmers Would Give Fortunes for This Stream

In regard to land, one can buy it around here for $65 to $100 an acre; the first mentioned kind is land which the owner has rented for some years, and on these farms the buildings may need some repairs and paint. Often one will find that there were once excellent buildings — timbers of solid oak, etc.— and that with a reasonable expenditure and work one would have these buildings worth as much as he paid for the whole farm. These farms have often been neglected and need attention, but with proper care and rotation of crops they soon can be made to yield heavily again. The higher priced lands are those on which the owners have been living themselves. As a rule, they are in good shape, with excellent buildings and they often have very fine orchards. By the way, nowhere can you get so good an apple or other kind of fruit as is produced here.

Here are also some drawbacks. For instance, the rainfall is heavier, and, while in itself a blessing, often causes the farmer some trouble in the spring. It makes the ground rather hard to work, as the soil generally packs itself quite easily. I know I shall positively overcome this by gradually getting my farm into alfalfa, and with liberal use of farm manure I expect to have a good loose soil, and one which cannot be excelled for bearing.

I was in my wheat field today and found the straws fully five feet long. I expect this field to yield me thirty-five bushels per acre. Anyone can raise this same kind of wheat here if it is handled right. It is an old field, probably farmed for over fifty years. My neighbors who know say that my hay will yield close to two tons per acre. I have fifty acres in hay this year. There is very little stone in the land here, not enough to bother. In fact, some stone is a sign of good land.

I don't want to say anything further, because the people will think I am a land agent. I have nothing to sell, but will be glad to advise anyone contemplating a purchase in this section, with regard to soil, conditions, etc. Here, as well as anywhere, you can get better or poorer lands. I have tried to give you a little idea just about conditions as I see them and would like to have many more good farmers take advantage of the comparatively low prices yet prevailing. Personally, I feel convinced that it is a matter of "Do it now," as later prices will be surely higher, when people realize what really is being offered here.

It should be noted that a brother of this farmer bought a farm of 143 acres in the Empire State and is as enthusiastic as his brother. Present crop prospects, he says, are "A. No. 1. You couldn't lay an eye on anything more beautiful. When I pass some of these half-farmed lands I only wish that many Westerners could know and have a chance at such places."

Another letter is from a German farmer who came to the Empire State from Iowa. He purchased a farm of 100 acres in Oneida county at $27.50 an acre.

> I believe my experience here for three years on a so-called run-down farm will fit anywhere in New York State. Having sold my farm in Iowa, I made a trip to New York State and bought a farm in December, 1910. I moved here March 1, 1911, bringing five horses and one carload of oats. It took just five days to get here from Iowa. About the middle of April we started to plow and plowed thirty acres. We put eleven and one-half acres in oats, twelve acres in corn, three acres in peas and three acres in sweet corn, the last two crops being for the canning factory. We sowed grass seed in the oats and peas. The oats harvested sixty-five bushels to the acre and the grass seeded well. From one acre of potatoes we got about one hundred bushels.
>
> The second year, 1912, everything went a little better. We sowed eleven acres of oats that spring. We had a good crop of hay and the oats did the same as the year before. Our potatoes ran 200 bushels to the acre. In 1913 everything went a good deal better because we knew just how to go at it. We had ten acres of oats, six acres of winter wheat, eight acres of corn and four acres of peas for the canning factory. We used no fertilizer on the wheat and we certainly had a fine crop, the straw being four to five feet long. We used some fertilizer, about 100 pounds to the acre, on the corn and oats, but as soon as we get it manured we shall not need fertilizer. The corn was fine; stalks from fifteen to eighteen feet high.

How Doth the Busy Bee Improve Each Shining Hour in New York

We like it real well out here. We are well pleased with the land. There is a big house, also a barn and other outbuildings. Of course there is some need for repair. Everything seems to grow so much better here than out in Iowa. If the people would work here as they have to work in the West they would be much more successful. We raised better wheat and oats than we ever did in the West. We have never seen such big potatoes as we raise here and we never had such a garden in the West. If you know of any Germans just send them out here. They are welcome any time, and we would be pleased if we could have a few more Germans in the neighborhood.

A third letter is from a German farmer who bought a farm in Otsego county about two years ago. Illustrating the ease with which a purchase may be financed, it may be mentioned that the farm of 185 acres, with fine buildings, three miles from railroad, was bought for $5,000, with $500 as the first cash payment. He writes as follows:

Yesterday I spoke with one of the Nebraska farmers who lately bought a farm here, and he said you could make money much easier here than out West, and that the climate is much healthier. I should like to know what farms will be worth here ten years from now. One German who bought a farm last year has already been offered a much higher price. All who are willing to work are getting along fine, and we are getting the best prices for all products. In March I sold twenty pigs four weeks old for $4 each. In April I sold twenty-five pigs six weeks old for $5 to $5.50 each. Last week I sold four fat hogs at thirteen cents a pound for $91. I now have twenty-five cows, fifteen head of young stock, four horses and ten breeding sows. I am going to build a silo this summer, to hold 120 tons of silage. I take my cream to a station at Laurens and use the skim milk for the stock.

If you send any German farmers here I shall be glad to help them and can board them while they are looking around. I know of several good farms here.

Another letter from an American farmer who recently came to the Empire State from the West states that he does not know of " any place where one can buy as beautiful a home as in New York." Similar expressions and experiences could be multiplied from extracts in the many letters on file in the Department. They all go to show that in the Empire State there await all the opportunities which the farmer may desire. Here are improvements, markets, schools, churches, neighbors — all those things that men want most when they establish themselves in a community. All are within easy reach of farms which may be procured at from $25 to $100 an acre, and which will produce as large crops as land in the West or South for sale at double the price of Empire State land.

"Hereafter, when a young man with a few hundred dollars asks me in what section he can engage in farming to the best advantage, I shall ask that he be directed to the possibilities existing throughout New York State."

JAMES WILSON,
Former Federal Secretary of Agriculture.

STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

CHARLES S. WILSON, Commissioner

Bulletin 74

Report of Farmers' Institutes

Including Addresses

Year June 15, 1914, to June 14, 1915, Inclusive

BY

EDWARD VAN ALSTYNE

Director

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REPORT OF FARMERS' INSTITUTES

JUNE 14, 1915.

To HONORABLE CHARLES S. WILSON, *Commissioner of Agriculture, Albany, N. Y.:*

MY DEAR SIR.— I herewith submit to you my annual report as Director of Farmers' Institutes for my third calendar year ending June 14, 1915.

The work during the last four months of the fiscal year, ending September 30, 1914, was materially curtailed for lack of sufficient funds. This necessitated the abandonment of considerable of the " follow-up " work, much to the disappointment of those who had expected to receive it. It also materially and seriously interfered with some lines of experiments which had been in operation for two years, and should continue for a year or two more to reach satisfactory conclusions. Some of the most important of these were saved by Mr. D. P. Witter who voluntarily carried them on without compensation. The cow testing work was likewise affected. Serious handicap was avoided by assistance from the funds of the Cooperative Bureau. It was with much regret that your Director for the same reason was obliged to refuse help to farm bureau managers for cooperative work, and to granges, farmers' clubs and other local organizations for lectures and demonstration work, such as they had hitherto received. Only by the assistance of the farm bureau managers was it possible to hold the county conferences to arrange for institutes and perfect local arrangements. I emphasize these conditions that the contrast between the figures given this year and last may be accounted for.

With much satisfaction I have taken up the work since the Governor approved the legislative appropriation in the supply bill for the maintenance of the work in its various lines, without which all our work must have come to a standstill.

Aside from the above limitations, the work has been eminently successful from the standpoint of both the workers and those receiving it, as manifested in the reports, personal letters and word-of-mouth expressions of appreciation. A few more institutes were held than during the year preceding, with an average attendance slightly increased; this in spite of the fact that an increased number of the institutes have been held in small hamlets.

I would particularly call attention to the detailed report of the women's work. Never has it been so well systematized, or the force been so efficient and well adapted to meet the needs of rural life, and never has this work been received with like favor. No phase of the various lines of the work carried on by my bureau has given greater returns, or promises more for the future. After more than a decade of honest endeavor along this line, the women's home work is now firmly established, and occupies a place in no way second to that pertaining to the farm. The system of reports of rural conditions, by the women workers, has given me a detailed knowledge of matters pertaining to rural life in the various parts of the state, as well as the names of local workers, which will enable me to render more efficient service along this line than ever before. As soon as the way is clear I shall install a woman assistant to have charge of the women's work, thus prosecuting it with more intelligence and vigor. Some special work of this sort has already been done, Mrs. Harrington having visited five sections where institutes had been held, continuing and extending the work.

The Agricultural College, Experiment Station, secondary schools, Conservation Commission, Syracuse State College of Forestry, with our State Education Department, have given freely of their best in the furtherance of the work. State Entomologist Felt, in cooperation with my bureau, has undertaken a series of experiments in combating the codling moth in Monroe, Orleans and Niagara counties, details of which will be presented a year hence.

The close relations between the institutes and farm bureaus have not only been maintained but strengthened. In January last, your predecessor, Hon. Calvin J. Huson, placed the farm bureau work, as it relates to the State Department of Agriculture, in my charge, which has helped to " strengthen the cords and lengthen the bands."

As shown under the special divisions of this report, the cow testing work, farm bulletins, State Fair exhibit, individual correspondence, have all been maintained, and their scope — and I am sure their efficiency — enlarged.

The bureau was represented at the National Dairy Show at Chicago by Mr. D. P. Witter. The National Association of Farmers' Institute Workers at Washington, D. C. was attended by myself, two of my women workers, Mrs. Ida S. Harrington and Mrs. Rose Morgan, and by Professor Tuck of Cornell. The latter three acquitted themselves with great credit to themselves and their state, your Director being chairman of the Executive Committee. The bureau has also had representatives at the New York State Fruit Growers Association meeting, and the New York State Dairy and Breeders meeting, and has assisted with the Farmers' Week programs at Morrisville, Alfred and Canton.

I would call special attention to the program and report of the Normal Institute held at Geneva, November 16, 17 and 18, 1914, given more in detail than in my previous reports. The Normal report contains much definite, up-to-date agricultural information, and furnishes the foundation of instruction given by Farmers' Institute workers and farm bureau managers. It is based on the research work of experiment stations and is in harmony with the teachings of our colleges and agricultural schools. The reports of instruction given from year to year in these Normal institutes marks the progress of agricultural thought, and, being thus preserved, should be a valuable contribution to our agricultural literature.

Following my usual custom of devoting some space to agricultural information in addition to that given at the Normal Institute, I this year give in full, in Vol. II of this report, the entire program of the Farmers' Day Meeting at Albion, N. Y., as presenting in the lectures and discussions a wealth of information on the fundamentals of agriculture — the soil and its treatment, live stock, farm crops, horticulture and topics related thereto, and poultry; as well as matters pertaining to markets, rural life, and the home. This also typifies the form and character of the matter presented at the institutes.

In all the work, I have endeavored as always to avoid the spectacular and revolutionary, and adhere to the principles of evolution. This means gradually eliminating the useless and obsolete and as gradually building in the useful and progressive, thus serving the state by an endeavor to maintain and elevate to the highest, the standards of citizenship as well as of agriculture, appreciating that without the former the latter can never be obtained The accomplishment of this can be brought about only by an appreciation and adherence to the principle laid down by Disraeli—"The secret of success is constancy to purpose."

Most respectfully submitted,

EDWARD VAN ALSTYNE,
Director of Farmers' Institutes.

NORMAL INSTITUTE

Following is program of the Sixteenth Annual Normal Institute, held at the New York Agricultural Experiment Station, Geneva, November 16, 17 and 18, 1914, with summary of the proceedings:

PROGRAM

MONDAY

9:45 A. M. Opening — Dr. Jordan.
Response — Commissioner Huson.
10:00 A. M. Essentials Relative to Phosphorus and Potash — Prof. Cavanaugh, Dr. Van Slyke.
11:00 A. M. The Latest Concerning Lime — Mr. Collison, Prof. Fippin.
2:00 P. M. The Year's Experience With Alfalfa, Vetch, Soy Beans, Sweet Clover — Prof. Montgomery, Mr. Robertson.
3:00 P. M. Concrete as the Coming Material for Constructing Farm Buildings — Mr. Curtis.
7:30 P. M. Criticisms and Suggestions:
From the Experiment Station — Dr. Jordan.
From the College of Agriculture — Prof. Tuck.
From the Farm Bureaus — Mr. Burritt.
From the Institute Force — Mr. Witter.
From the Institute Force — Mrs. Harrington.
Summary, With a Word to the Workers — Director van Alstyne.

Each leader to occupy ten minutes, to be followed by general discussion.

TUESDAY

9:00 A. M. Conference of those in charge of meetings.
10:00 A. M. Economy in Milk Production — Dr. Jordan, Mr. Smith.
11:00 A. M. Hay: Seed, Culture and Fertilization — Prof. Myers, Prof. Montgomery.

2:00 P. M.	Horticultural Teachings — Prof. Wilson, Prof. Hedrick.
3:00 P. M.	Combating Insects on Fruit and Farm Crops — Prof. Parrott, Prof. Crosby.
4:00 P. M.	Diseases of Fruits and Farm Crops — Prof. Barrus, Prof. Stewart.
7:30 P. M.	The College of Agriculture — Dr. Galloway. Agricultural Cooperation in Europe (Illustrated) — Mr. Mitchell. Developing the Moral and Ethical Side of Farm Life — Miss Huff.

TUESDAY

WOMEN'S CONFERENCE

(In Charge of Mrs. Harrington.)

General Topic for the day: The Cooperation of the Home With Agencies for Home Betterment.

10:00 A. M.	Director's Conference With Women Workers.
10:30 A. M.	Nature Study as a Link Between School and Home — Mrs. Phelps.
11:00 A. M.	Discussion.
11:15 A. M.	Home Economics in Connection With Farm Bureau Work — Miss Mills.
11:45 A. M.	Discussion.
1:30 P. M.	Round Table: How Can We Use Last Year's Experience to Better This Year's Work?
2:30 P. M.	Canning Club Work — Miss Nye.
3:00 P. M.	Discussion.
3:15 P. M.	Home Economics at the College of Agriculture — Prof. Van Rensselaer.
3:45 P. M.	Discussion.
4:00 P. M.	The People's Choral Union in New York: Can Its Methods be Adapted to the Needs of Rural Communities? — Miss Huff.

WEDNESDAY

9:00 A. M.	Practical Farm Cooperation — Mr. Cole, Mr. Mitchell.

10:00 A. M. Farm Management — Dr. Warren, Mr. Burritt.
11:00 A. M. Farm Bureaus — Mr. Burritt.
1:30 P. M. Summary of Findings of Agricultural Experiment Stations — Mr. Hall.
2:30 P. M. The Latest in the Poultry Industry — Prof. Rice.

Summary of Proceedings of the Sixteenth Annual Normal Institute for New York State Workers

THE RELATIONS OF PHOSPHORIC ACID TO AGRICULTURE

DR. L. L. VAN SLYKE

1. *Definition:*

The term *phosphoric acid* used in its chemical sense means the oxide of phosphorus ($P_2 O_5$), but used agriculturally it means the compounds of phosphorus or phosphoric acid, which are called phosphates. It is the custom to express the amount of phosphate compounds in the form of phosphoric acid; for example, acid phosphate contains 14 per cent of phosphoric acid ($P_2 O_5$); bone 20 to 25 per cent, etc.

2. *Forms or Compounds of Phosphoric Acid:*

In fertilizers phosphoric acid is usually present in the form of three different calcium (lime) compounds:

(1) *soluble* phosphoric acid (acid or mono-calcium phosphate)
(2) *reverted* phosphoric acid (neutral or di-calcium phosphate)
(3) *insoluble* phosphoric acid (tri-calcium phosphate)

The first two forms taken together are called *available* phosphoric acid.

3. *Some Fundamental Facts about Phosphoric Acid:*

(a) Phosphoric acid is essential to the life of all plants.
(b) Phosphoric acid must, therefore, be an essential constituent of all agricultural soils.
(c) The amount of available phosphoric acid in soils is usually much less than the amount of available nitrogen or potash.
(d) Sooner or later, under usual conditions of farming, available phosphoric acid drops below the requirements of profitable crops, and this often happens sooner than in case of nitrogen or potash.

(e) Phosphoric acid compounds are lost to the soil, whether through removal of crops or loss in drainage, in smaller amounts than of nitrogen or potassium compounds.

4. *Chief Sources of Phosphoric Acid:*

(a) Rock-phosphate, occurring in deposits of tri-calcium phosphate in practically unlimited amounts and widely distributed in different sections of the United States.
(b) Acid phosphate or superphosphate made by dissolving rock-phosphate in sulphuric acid, and containing 14 to 16 per cent of available phosphoric acid, together with much calcium sulphate (gypsum).
(c) Bone, mainly in the form of steamed bone-meal and raw ground bone.

5. *Use of Acid Phosphate:*

When immediate action is desired in crop growth soluble phosphoric acid (acid phosphate) should be used.

6. *Use of Untreated or Raw Rock-Phosphate:*

Essential conditions for satisfactory use of raw rock-phosphate are the following:

(a) Abundance of decaying organic matter in the soil, furnished by farm manure or green crops.
(b) A goodly supply of calcium (lime) carbonate, applied in such form as the calcium can be purchased most cheaply.
(c) Rock-phosphate should be ground very fine.
(e) The action of raw rock-phosphate, even under favorable conditions, is gradual; little effect is shown the first season.
(f) Raw rock-phosphate has no special value as an absorbent more than any inert material of equal fineness.
(g) No special advantage appears to be gained by mixing raw rock-phosphate with manure in the stable.
(h) Before applying rock-phosphate on a large scale farmers are advised to experiment for a time on limited areas, using 1,000 pounds an acre once in four or five years.

7. *Cost of One Pound of Phosphoric in Different Forms:*

	Highest cents	Lowest cents	Average cents
(a) In complete fertilizers:			
(1) Low-grade (containing less than $16 worth of plant-food per ton)	9.3	4.8	7.1
(2) Medium-grade (containing $16 to $20 worth of plant-food per ton)	10.0	4.2	6.3
(3) Medium high-grade (containing $20 to $25 worth of plant-food per ton)	9.6	4.2	5.9
(4) High-grade (containing $25 or more worth of plant-food per ton)	7.2	3.4	5.3
(b) In acid-phosphates (ton price $9.97 to $22)	8.3	3.5	4.9
(c) In mixtures of acid-phosphate and muriate of potash	9.1	4.3	5.6
(d) In mixtures of bone and muriate of potash	11.8	6.2	5.0
(e) In bone-meal	6.7	3.2	4.6
(f) In tankage	4.8	2.5	4.1
(g) In dried sheep manure	20.0	8.0	10.0
(h) In wood-ashes	21.7	20.3	21.0
(i) In raw rock-phosphate (floats)	1.9	2.2	2.1

8. *Suggestions Relating to Purchase of Phosphoric Acid:*

(a) The cheapest form in which to purchase readily available phosphoric acid is acid phosphate; it costs more when purchased in mixtures with other materials. Acid phosphate containing 14 per cent of available phosphoric acid should usually cost not more than $11 to $12 a ton.

(b) In the less quickly available form of bone, bone tankage rather than bone-meal furnishes phosphoric acid at smaller cost.

(c) Raw rock-phosphate, while often sold at $13 a ton, should be purchased at a price not to exceed $8.50.

LIME

PROFESSOR E. O. FIPPIN

1. *Status of knowledge.* Our knowledge concerning the nature of soil acidity and the effects of lime, together with the relative efficiency of different forms of lime in the soil and their effects on the various factors that determine fertility of the soil, is still very incomplete. Similarly, our knowledge as to the exact relation of different varieties of crops and field plants to soil acidity and lime is very incomplete. Information of this sort is accumulated very slowly and it is important that we retain an open mind for new data.

2. *Nature of soil acidity.* Definitions of soil acidity are difficult to frame and are largely unsatisfactory. Two classes of material in the soil may give rise to acidity. These are the inorganic or mineral acids and the organic acids resulting from the decay of organic matter. The earlier notion that organic acids are relatively few in number and simple in composition and relationship is now thoroughly displaced. A large number of organic acids in the pieces of plants, and also resulting from the decay of organic matter in the soil, are now known. They vary with the soil and the plant. That definite free acids occur in the pieces of plants used as green manure is shown by a recent study of Covill, of the U. S. Department of Agriculture:

Crop	Yield per acre	Lime content	Free acidity expressed as lime requirement
Alfalfa	2½ tons	193 lbs.	267 lbs.
Red clover	2 tons	131 lbs.	142 lbs.
Cow pea	2½ tons	92 lbs.	200 lbs.
Rye	2 tons	11 lbs.	178 lbs.
Broom sedge	1 ton	4 lbs.	89 lbs.

Acid constituents in the soil may be in both the soluble and insoluble condition; the former would appear freely in the soil water. Such a condition is very unusual, as the soil solution is usually neutral or alkaline. Nearly all soils have a large excess of silicic acid which is very insoluble either in silicate compounds or in the form of quartz grains.

Soluble acid materials produce a positive acid condition. The insoluble forms are termed negative acidity and may be called lack of basicity. In either case lime and other basic elements will be actively taken up.

3. *Forms of lime.* Results on the Cornell University Farm and on plots at Virgil, both of which have continued for only two or three years and from which no decisive conclusions can be drawn, have shown somewhat better results from caustic than from carbonate lime.

Magnesium lime has given results inferior to calcium lime.

4. *Disappearance of caustic lime and of calcium and magnesium lime carbonate in the soil.* Bulletin 107 of the Tennessee Station, recently published, gives the most definite data available on many of these points. Tests in carbonated water and in car-

bonated wet soil showed that both calcium and magnesium oxide were completely carbonated in four hours. The indication, therefore, is that caustic lime does not remain in the normal soil as such for more than a few hours or days at the most, and any difference in the effect of caustic and carbonate lime on the soil after that date must be due to some other factor than persistent causticity.

Magnesium carbonate is found to rapidly disappear from the soil due to the union of the magnesium oxide with silicia to form the silicate of magnesium which is only one-third to one-fourth as soluble as dolomite. This change occurs to a large extent in a few weeks. As much as fourteen tons were found to disappear in an acre, seven inches of very acid soil. Calcium carbonate is very much less affected in the same manner. Injury from the use of magnesium lime is probably due to the silicate compounds and not to its persistence either as caustic magnesia or as magnesium carbonate, which latter is only half as soluble as calcium carbonate.

The magnesia in silicate form has some value to keep the soil sweet and promote the growth of lime-loving plants.

New York soils pretty generally contain more magnesium than calcium in total. Strongly magnesian lime is, therefore, not desirable on the soil. However, the use of a lime containing not over 15 per cent of magnesia is not seriously objectionable.

5. *Fineness of limestone.* Bearing on the relation of fineness to solubility, the Tennessee investigations show that ground limestone passing a one hundred mesh screen, and in which the average length of crystals was .005 millimeter (.0002 inch), was only 7.7 per cent as soluble in carbonated water in four hours as precipitated chalk in which the average length of crystals was .0003 mm. (.000012 inch). This difference in solubility may be attributed to difference in surface exposed by the particles to solution.

No conclusions as to the proper fineness can be drawn from field tests where limestone containing particles of a wide range of fineness is used.

The possibilities of distributions may readily be calculated. Assuming that one ton of ground limestone is uniformly distributed in the surface six inches of soil of one acre, the number of particles in each cubic inch of soil for different degrees of fineness would be as follows:

Diameter of limestone particles	Particles per cubic inch of soil
1/10 inch=2. millimeters	2.
1/50 inch=0.5 millimeters	137.
1/100 inch=0.25 millimeters	1200.

Since the diffusion of soluble material through the soil is known to be exceedingly slow, the inference is that large particles of lime would form a thin shell of neutral or slightly alkaline soil and the remainder of the mass would be influenced only as the capillary movement of water carried the lime carbonate beyond this shell. The probabilities of the tenth-inch materials reaching the entire cubic inch of soil within five years is small.

The following statement of influence of fineness upon availability was agreed to by Messrs. Van Slyke, Fippin, Cavanaugh and Collison:

First. Availability is approximately proportional to fineness.

Second. Ten mesh stone has about 50 per cent that will pass a 50-mesh sieve.

Third. Use of ten-mesh size vs. fifty-mesh size depends on quantity to be used and on cost of both material and of handling, including freight.

Fourth. About twice as much ten-mesh sieve as of fifty-mesh is required to furnish amount necessary for five-year period or average period of rotation.

ALFALFA

PROFESSOR E. G. MONTGOMERY

The culture of the common alfalfa in America dates back at least one hundred years. Increased interest during the past twenty years has caused much searching for new varieties by the United States Department of Agriculture, especially for types adapted to the drier and colder regions.

Writing on this subject, C. J. Brand (1) says: "During the period that elapsed from May, 1898, until November, 1904, forty-two strains were introduced from different parts of the world; fifteen from Turkestan; other strains were the Province, Poitou, and Sand Lucern. Also strains from Arabia, Peru, Argentine and various other sources were received. Since the autumn of 1904 nearly 200 numbers have been introduced from various parts of the world; in addition, a large number of more or less distinct strains have been secured from various parts of the United States, and a still larger number have been obtained from propagation of seed from previous introductions. All of these domestic and foreign races and their progeny constitute the richest material for the study of breeding of alfalfa ever brought together."

Some experiments with strains at Dickinson, North Dakota, show the following percentages:

Winter Killed

5 strains from South America	99.6%
2 strains from Africa	100.0%
2 strains from Russia	83.9%
5 strains from Germany	83.1%
5 strains from France	89.6%
12 strains from Turkestan	72.3%
2 strains from Canada	45.4%
18 strains from the United States	83.3%
3 strains from Nebraska	76.4%
3 strains from Montana	65.4%
1 strain Grimm Alfalfa from Fargo, N. Dak.	2.8%
1 strain Grimm Alfalfa from Clearwater, Minn.	7.0%
1 strain Turkestan Alfalfa from Highmore, S. Dak.	9.2%

However, long before the United States Department of Agriculture began its search, immigrant farmers from Europe had brought alfalfa seed to America and sown it in many places. The Grimm alfalfa and Ontario are examples — both apparently coming from Germany, from the old European Sand Lucern.

In 1857 the strain of alfalfa known as Grimm was introduced into Minnesota by the immigrant farmer, Wendelin Grimm. This strain, owing to its hardiness and good cropping qualities, has gradually spread through many of the northern and northwestern states of America; it is also found in many parts of Canada, and is now recognized as being probably the best known strain we have for withstanding severe winter conditions.

Some fifteen to eighteen years after the introduction of the Grimm strain into Minnesota, the alfalfa known as the Ontario Variegated was introduced into the Niagara district in Canada.

It appears that about 1871 a farmer named Bethel, who was then living near St. Catherines, obtained a sample of alfalfa seed from a German shepherd who brought it from Germany.

A few years later, in 1875, Dr. Collyer, a medical man, who was then living at Wellandport, near Niagara, also secured a sample of seed from Germany. Both strains had variegated flowers. As to whether there was originally any decided difference between the two in point of hardiness, variegation or productive capacity there does not appear to be any authentic evidence on record. If there were any differences in the strains when imported they have become obliterated, probably owing to the strains having become mixed when grown by various farmers in the district, and now the two strains appear to be merged into one, known as Ontario Variegated.

It may be stated here that the Grimm Alfalfa and the Ontario Variegated have many points in common. In both strains a fair percentage of plants are found which have variegated flowers, both yield heavy crops, and many plants are found having branched tap-roots; also some plants produce vigorous rhizomes. These distinctive root characteristics give hardiness to the plant and enable it to withstand severe conditions without much risk of being killed out.

The varieties now best known may be classed as follows:

Blue Flowered

1. Peruvian } Adapted only to southern half of U. S.
2. Arabian }
3. Common — Adapted to all but coldest regions of U. S.
4. Turkestan — Similar to Common but more cold resistant in some places.

Variegated Flowers

5. Sand Lucern }
6. Grimm } All more cold resistant in the northwest.
7. Ontario Variegated }
8. Native Black Hill type

Yellow Flowers

9. Siberian — Very cold resistant, but not productive.

Very little work with the different varieties has been done in New York, though the hardier varieties are undoubtedly superior in the northwest. The Common succeeds most places and is to be preferred, but where winter killing is common the "hardy" alfalfa should be tried in a small way.

Variegated seed can be secured:

Grimm — From A. B. Lyman, Excelsior, Minn.

Hardy Black Hill strains — From Dakota Imp. Seed Co., Mitchell, S. Dak.; W. L. Miller Seed Co., 158 E. 5th st., St. Paul, Minn.

There is no Ontario seed on the market.

ALFALFA, WINTER VETCH, SOY BEANS, AND SWEET CLOVER IN NORTHERN NEW YORK

F. E. ROBERTSON

ALFALFA

Alfalfa in the northern part of the state must be seeded early in the season, particularly in Jefferson county, not later than the middle of June. August seedings are invariably seriously injured by winter killing due apparently to the fact that the plants seeded late do not become well established. Liming the soil, and inoculating the soil or seed, are both important precautions to observe in spite of the success some have had although disregarding all precautions. As a general practice only two crops should be cut from fields of alfalfa grown in this part of the state. During the past season (1914), however, three good crops have been harvested from nearly every field of importance.

Experience with Grimm alfalfa during the past three seasons does not justify advising that prospective growers should use this seed in preference to ordinary alfalfa seed, particularly when the extra cost of the so-called hardy alfalfa seed is taken into consideration. This is not final judgment on this point as the field trials have not been continued a sufficient number of seasons.

Many farmers are now mixing alfalfa seed with their clover and thus securing a crop of mixed legumes. There appears to be no particular objection to this practice.

WINTER OR HAIRY VETCH

Much interest has recently been shown in the growing of winter vetch as a supplementary fodder crop. Its use as a cover crop in the fruit and tobacco sections is well known, but its use as a fodder crop is not generally known nor appreciated. *Thousands of acres of winter vetch have been sown in Northern New York during the past season and have given universal satisfaction.*

As a forage crop to supplement the clovers, winter vetch is generally seeded in the spring, by mixing the vetch and oats together, at the time of seeding the land to clover and the grasses. In this practice the vetch grows with the oats similar to the manner that spring vetch or field peas grow. The crop may be cut for hay or grain as desired, although if intended for hay the proportion of seed sown would be somewhat different than for a seed crop. After the oat and vetch crop has been harvested the vetch continues to grow along with the clover and grass seed, and, being winter hardy, continues to grow the following season along with the clover and timothy. Thus two crops of vetch are secured.

The rate of seeding recommended is:

	Oats per acre	Winter vetch	Grass and clover
For a grain crop	1½ to 2 bu.	8 to 12 lbs.	Usual amount
For a fodder crop	2½ to 3 bu.	12 to 15 lbs.	Usual amount

While the amount of vetch seed recommended has a range from 8 to 12 pounds per acre, which amount does not make the cost prohibitive, it has been found that 10 pounds per acre is usually ample; on some soils less seed would be desirable. As a fodder crop no particular difficulties are experienced in the matter of harvesting.

Winter vetch also has a place in the rotation of hay farms where two crops of grain are grown in succession. In this practice 12 to 15 pounds of vetch seed may be sown with the first crop of oats. The combined crop may be cut for hay or grain. Following the oat harvest the vetch makes a luxuriant growth and may be plowed under in the fall along with the oat stubble. Inoculation of seed is not necessary in Jefferson county.

SOY BEANS

This legume appears to give satisfaction on some farms when grown with silage corn. That it adds materially to the feeding value of the silage there is no doubt. The variety best suited to northern states is the Early Green, which is readily recognized by its bright green seeds.

Where silage corn will grow well, soy beans will thrive. Where the silage corn is planted too thick, as is frequently the case, or where the soil is poor, the soy beans will not grow any better proportionately than the corn. Under these conditions the soy beans do not grow vigorously and are therefore frequently misjudged and discarded as a supplementary crop.

In common practice soy beans are seeded with silage corn by sowing four to five quarts of beans in addition to the regular amount of corn. Thus the seeding is done at one operation. In the fall the corn and beans are cut together by one operation of the binder. This practice simplifies the use of soy beans in connection with silage corn.

Soy beans and silage corn may be planted separately by devoting an area of ground to each; or, they may be planted in alternate rows, two of corn and one of beans. Either of these methods entails extra labor in planting and harvesting.

If it should be desirable to grow soy beans for seed they should be planted early — soon after May 15 in Northern New York — as they need all the time they can get to mature before killing frosts, which usually occur between September 10 and 20 in the northern part of the state.

SWEET CLOVER

Sweet clover is a new plant, as regards its economic use, in New York; hence it has not been generally grown. Cattle feed upon it greedily providing it is not allowed to grow rank.

In Jefferson county there are at the present time over 30 acres of sweet clover growing as a hay crop. One field of 6 acres seeded in 1913 made a poor stand owing to the dry season. This was allowed to self-seed during the season of 1913. It is now (1914) growing luxuriantly, having been pastured the greater portion of this summer and fall. Naturally the use of the field during 1913 was lost.

All other sweet clover in the county has been seeded by sowing with oats during the spring of 1914 at the rate of 6 to 8 quarts per acre. At the present time these fields have a perfect stand of sweet clover and appear very promising.

Isolated attempts to get sweet clover established in rough hawkweed infested pastures have failed owing to the fact that the seed when sown in the spring did not germinate well.

CONCRETE AS THE COMING MATERIAL FOR CONSTRUCTING FARM BUILDINGS

*ARTHUR J. R. CURTIS

Our first requisite in making concrete is to know what constitutes suitable materials.

The principal requirements of sand and gravel are that they be clean, hard and well graded. Clay, loam, or vegetable or other foreign matter should not be permitted in amounts exceeding 5 per cent. Material which when rubbed between the palms of the hands leaves dust or dirt upon them, should be washed. Much of the dirt can be removed by turning water on the material in the pile, or, if convenient, by driving each load of gravel into a stream. Beware of sandstone, shale and decaying stone, remembering that concrete cannot be stronger than the materials of which it is made. Sand proper includes that part of the bank run gravel less than one-fourth inch in size, and gravel proper that part which is greater than one-fourth inch in size. Sand should contain particles running from fine to coarse, with the coarse predominating. Fine sand, such as used for plaster, should be avoided wherever possible. The largest particles of the gravel proper should not be greater in any dimension than one-third the thickness of the finished concrete.

Portland cement of any well-known brand is acceptable, but on opening it is well to run the hand into occasional sacks in search of lumps. Cement containing hard lumps should be discarded. as it has undoubtedly come in contact with moisture, weakening its hydraulic properties. Soft lumps which break under the pressure of the fingers are generally caused by the weight of

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* Member American Society of Agricultural Engineers. Present through the courtesy of the Universal Portland Cement Co., Chicago, Ill.

sacks piled on top of it in the warehouse, and do no damage if broken up. Cement should always be stored in a dry, cool place, absolutely protected from moisture.

Proportions and Mixing: Athough much concrete has been made by mixing cement with gravel as it comes from the pit, this practice cannot be recommended because it always results in an incorrect and constantly varying proportion between cement, sand and coarser material. It is safe to assume that for ordinary work the volume of the sand in the mixture should be about twice that of the cement, and the volume of the screened gravel about twice that of the sand, giving the mixture referred to as 1 : 2 : 4. This may be varied somewhat to fit the character of the work in each case, but for practically all farm work about twice as much screened gravel as sand should be used. Where several batches are mixed for the same job, the proportions must not be allowed to vary.

To properly screen, proportion and mix concrete, three pieces of equipment are necessary — the screen, measuring box and mixing platform. The screen may consist of a piece of 3/8-inch square wire mesh, mounted on a frame 6 feet long and 3 or 4 feet wide, supported at an angle when in use. This will pass material finer than ¼ inch in size (sand) separating it from the screened gravel. The measuring box consists simply of four sides without top or bottom, and is made 36 inches long, 16 inches wide and 12 inches deep, inside measurements. The mixing platform consists of a smooth, level, water-tight floor at least 7 feet by 12 feet, and preferably made with runners so it can be dragged to any desired location.

It is best to mix concrete in batches requiring one sack or multiples of one sack of cement. As each sack contains one cubic foot, a one-sack batch of 1–2–4 concrete requires one sack of cement, two cubic feet of sand (measuring box half full) and four cubic feet of screened gravel (measuring box full). The cement and sand are mixed together once without water, after which the screened gravel is added. After turning the gravel over until it is *thoroughly* mixed with the cement and sand, the mass is mixed again with water until it is uniform and just wet enough to flatten out when placed in a pile. It must be placed in the forms within 30 minutes after the water is added and must be kept damp for a week or ten days at least, to prevent any of the moisture from leaving the green concrete.

Reliable Information: There is considerable information available on the subject of concrete in its relation to farm improvements, and every institute lecturer and farm adviser as well as every farmer should avail himself of it. Farmers' Bulletins Nos. 403, 461 and 481 by the U. S. Department of Agriculture, are devoted to concrete work, and almost all of our agricultural colleges, as well as the manufacturers of cement, have published reliable information on this subject.

When the farmers in general have become acquainted with the simple essentials for making good concrete, there is no doubt but that this material will be used generally in every kind of structure on our farms. For work which does not involve complicated re-enforcing problems, the farmer, with a knowledge of the essentials for making good concrete, is limited only by his ability to construct forms, and for this work a fair knowledge of carpentry is usually sufficient.

It is well to remember that concrete work is expected to be permanent and is therefore worth doing *right.* A slovenly job of concreting is an abomination, but a careful piece of concrete work is a lasting satisfaction and something that your posterity can look upon with pride.

NOTE.— The question arose as to whether silage would keep well in a concrete silo. This has been practically demonstrated in many cases over the state. Attention is called to article, "Chemical Changes During Silage Fermentation," by Ray E. Neidig, Station Chemist at the Iowa Agricultural Experiment Station, to be found on page 2401 of the Journal of the American Chemical Society, November, 1914.

ECONOMY IN MILK PRODUCTION

DR. W. H. JORDAN

The first essential is high class animals. The Station has a herd of such animals which has been developed by methods that may be copied by any fairly well-to-do farmer.

(1) Dams for mothers should be selected with reference to constitution and vigor as well as production. Good grades may be used with excellent results.

(2) The use of a full-blood male bred from a line of large producers is a fundamental requisite. A number of farmers may wisely and economically cooperate in securing and maintaining such an animal. The breeding and quality of the male is a very important factor.

The feeding of the herd comes next in importance:

(1) This should be generous but not excessive. No animal in the station herd receives at any time over 8 pounds of grain per day in order to support an average yearly production per cow of over 400 pounds of butter.

(2) This small grain ration is made possible through the use of good corn silage and good hay, much of it clover and alfalfa. Farmers as a rule produce too little of their cow feed and use up their profits in buying grain. Alfalfa, clover and corn should be important features of a dairy farm.

(3) Many farmers do not buy grain wisely. As a rule it is wise to avoid feeds containing inferior ingredients, such as oat hulls, oat clippings, screenings, ground corn cob and similar materials. Farmers may well purchase their grain supply cooperatively, confining their purchases to standard materials. It is unwise to pay nearly grain prices for inferior stuff such as is found in many compounded feeds, though not in all.

The time has come when dairy farmers must give close attention to the sanitary quality of the milk they produce. This means:

(1) That the cows must be free from disease. No farmer can afford to keep, indeed he has no right to keep, tuberculosis cows. Healthy cows are the first essential in sanitation.

(2) The production of a good grade of sanitary milk from healthy cows need not be expensive. The factors to be given primary consideration:

(a) A clean animal.

(b) Sterilized milk vessels.

(c) Milking pail of the right form.

(d) Prompt cooling of the milk.

(e) Holding milk under proper conditions of temperature and cleanliness.

(f) Scrupulous and constant care on the part of milkers in maintaining right conditions.

HOW A PROFITABLE HERD CAN BE BUILT UP AT SMALL EXPENSE

GEORGE A. SMITH

It is generally conceded by most dairymen who give the subject attention, that the first factor in profitable milk production is the cow that has the ability to transform food into a large flow of milk.

While he acknowledges this, he says it is not practical for him because of the difficulty of getting such cows.

To show that this is not a difficult problem, I have tabulated the results in the building up of the present station herd of Jerseys.

In 1900 when we found that we had been so unfortunate as to buy a tubercular cow, and in that way infect several of the animals, it meant that they must be disposed of and a new herd built up.

It was finally decided to put in force the so-called Bang method of eradicating the disease. The method and results are fully shown in Bulletin No. 277 of the Geneva Station.

While other cows were used earlier, they were gradually eliminated, until the present herd consists of practically two cows and their descendants.

The following tabulation shows what has been accomplished in this way, using a full blood sire from good producing families.

While the dam is an important factor, it must be kept in mind that the careful selection of the sire is of equal if not greater importance. A study of these figures shows that the higher butter fat test must have come from the sire.

	Dropped	Sire	Milk yield	Fat %	Estimated butter 15% overrun
Dotshome Carey	1900	*(1)	8001	5.18	476
Her calves.					
Carey of the Station	1903	*(2)	7194	6.11	506
Carey Fairy	1906	*(3)	7112	5.54	453
D. H. Carey B. B	1911	*(4)	3855	6.64	321
Carey of the Station Heifers.					
Carey of S. Fancy	1907	*(3)	7619	6.08	532
Carey of S. Blue Belle	1908	*(4)	7551	6.4	555
Carey of S. Blue Belle 2d	1909	*(4)	5571	6.93	444
Carey of S. B. B. Princess	1911	*(4)	5639	5.88	380
Gold Fern Carey S	1913	*(5)	......	......	....
Carey Fairy Heifers.					
Carey F. Blue Belle	1908	*(4)	5369	6.04	372
Carey Fairy Queen	1909	*(4)	6807	6.04	472
Carey Fairy B. B. 2d	1910	Sold	......	......	....
Carey F. B. B. Princess	1911	*(4)	4240	6.	292

	Dropped	Sire	Milk yield	Fat %	Estimate butter 15% overrun
D. H. Carey B. B. Heifers.					
Heifer	1913	Sold	......	......	....
Carey of S. Fancy Heifers.					
One lost with scours.					
Carey of S. B. B. Heifers.					
Oxford Carey of S. B. B	1911	*(6)	5664	5.82	378
Oxford Carey Lady Belle	1913	*(6)	......	......	....
Carey of S. B. B. 2d Heifers.					
Oxford Carey B. B	1911	*(6)	5766	5.88	390
Oxford B. B. Carey	1912	*(6)	......	......	....
Carey of S. B. B. Princess Heifer.					
Heifer	1914	......	......	......	....
Carey F. Blue Bell Heifers.					
Oxford Carey F. B. B	1910	*(6)	5555	6.16	393
Heifer	1914	*(5)	......	......	....
Carey Fairy Queen Heifers.					
Gold Fern Carey F. Queen	1912	*(5)	......	......	....
Carey F. B. B. Princess Heifers.					
Heifer	1913	Sold	......	......	....
Oxford Carey B. B. Heifers.					
Gold Fern Oxford Carey	1913	......	......	......	....

*(1) Sire Czar of Rivermeadow, Dam Queen Carey; *(2) Sire Prince of Astoria; *(3) Sire Kings St. L. Fancy; *(4) Blue Belle Prince; *(5) Jewels Gold Fern; *(6) Oxford Lad St. L. King.

The above shows that D. H. Carey and her progeny have dropped 23 heifers during this time. Of the 12 milking the past year, 6 were 2-year-old heifers. Of the 8 Millies milking shown in the following table, 2 were two-year-old heifers.

NAME OF COW	Register number	Dropped	Last year record milk	Average per cent of fat	Estimated butter 15 % overrun	Cost of food
Hammond No. 1	....	5/15/06	8,365	5.15	495	$61.20
Hammond No. 2	....	5/19/07	8,021	5.46	503	62.04
Gertie F. No. 1 B. B	....	4/29/08	7,844	6.29	566	65.58
Millie Fancy	185158	7/ 8/04	9,371	5.32	574	68.21
Millie F. B. B	202918	8/24/06	7,421	5.92	506	61.67
Millie D. of S. B. B	240381	5/ 9/09	7,252	6.3	525	62.69
Millie D. of S. B. B. 2d	254676	5/31/10	7,192	5.35	525	61.88
Millie of Geneva	177185	5/24/03	6,750	5.31	411	62.65
Millie of G. B. B	235924	7/21/08	5,603	6.81	439	61.41
Millie F. B. Lady	287866	12/ 3/11	5,558	6.	382	57.88
Oxford Millie D. B. B	265193	6/29/11	5,550	6.24	398	62.90
Dotshome Carey	176896	12/21/00	8,001	5.18	476	63.36
Carey of S. Fancy	216210	3/30/07	7,619	6.08	532	60.47
Carey of S. B. B	225922	5/16/08	7,551	6.4	555	59.76
Carey Blue Bell	240960	5/14/09	5,571	6.93	444	54.46
Carey F. B. B	225923	7/14/08	5,369	6.04	372	59.71
Carey Fairy Queen	240962	8/ 1/09	6,807	6.19	472	60.26
Oxford Carey F. B. B	254677	10/29/10	5,555	6.16	393	59.62
Carey S. B. B. Princess	265196	7/ 7/11	5,639	5.88	380	62.89
Carey F. B. B. Princess	265197	8/29/11	4,240	6.	292	58.23
Oxford Carey B. B	265193	6/ 6/11	5,766	5.88	390	63.33
Oxford Carey S. B. B	265200	10/20/11	5,664	5.82	378	59.07
Dotshome Carey B.	265195	7/ 6/11	3,855	6.64	321	60.90
Average	....	....	6,549	5.96	449	61.30

Silage fed in year average, six tons per cow.
Hay fed in year average, one half ton per cow.
Grain mixture 2,500 pounds.
Food cost of milk per 100 pounds, poorest cow $1.57.
Food cost of butter per 100 pounds, poorest cow 18.9c.
Food cost of milk per 100 pounds, best cow 72.7c.
Food cost of butter per 100 pounds, best cow 11.8c.

THE COST OF PRODUCING MILK IN JEFFERSON COUNTY

F. E. ROBERTSON

Nearly one year ago this bureau in cooperation with the State College of Agriculture (Dept. of Animal Husbandry) undertook to determine the cost of producing milk in this county. Owing to the fact that this information was to be compiled and published in the form of a bulletin from the State College we could not release the information previous to this time.

TABLE 1

Average production, cost of production, and profit.
834 cows.

Items	Production per Cow-pounds	Cost and profits Per cow	 Per 100 pounds milk	 Per pounds butter fat
Milk yield per cow	6,621			
Butter fat	241			
Cost of feed		$51 57	$0 77	$0 230
Fixed costs		35 65	54	137
Interest on investment and hauling		11 25	17	046
Total gross cost of production		$98 47	$1 48	$0 412
Credit by calf and manure		18 23	27	079
Net cost of production		$80 24	$1 21	$0 334
Value of production, at $1.52 per 100 pounds		100 63	1 52	....
Average profit		$20 39	$0 31	....

TABLE 2

Relation of milk yield to cost and profit.
834 cows.
Comparing groups of different productive ability.

GROUP	Group	Number cows in average production	Net cost of production	Value of production	Profit per cow	Net cost per 100 pounds milk	Profit per 100 pounds milk
5,000 lbs. or less	159	4,161	$57 20	$63 24	$6 04	$1 37	$0 15
5,001-7,000	360	5,993	74 40	91 09	16 69	1 25	27
7,001-9,000	214	7,843	92 00	119 21	27 21	1 16	36
9,001-11,000	84	9,764	109 00	148 39	39 39	1 11	41
Over 11,000	17	12,377	112 60	188 13	75 53	91	61
Total average	834	6,621	$80 24	$100 63	$20 39	$1 21	$0 31

This piece of work has the distinction of being the most extensive study of its kind. The facts brought out are based upon the use and study of reliable data, covering 53 different herds comprising 843 cows, on which complete yearly records of production of milk and butter fat and the cost of feed, labor and other expenses were determined. Each cow was given credit for her production of milk, calf and manure. Each cow was charged with the cost of feed, labor, equipment and capital invested. The difference between these two groups of factors represents net profit. Table 1 shows average cost and profit incident to the production of milk in Jefferson county during the year of 1913.

A study of table 2 will show that while it costs $112.60 per cow to produce 12,377 pounds of milk, the value of the product, sold at the same market price, is three times as great as from cows producing an average of 4,161 pounds. The net profit per cow for cows that produce 11,000 pounds or over is twelve times as great as that made from the cows producing 5,000 pounds or less.

It is evident on the face of the study that the profits in dairy farming depend directly on the ability of the cow to produce milk. We frequently find an inclination on the part of some dairymen to take what they can get from their herds and be satisfied. Such an attitude is well enough if a man is satisfied, but it is slow work paying off a mortgage by keeping cows that produce less than 6,000 pounds of milk per year.

The bulletin contains much other data relative to dairy conditions in Jefferson county and to costs and profits in the dairy business.

This bulletin is No. 357, "The Cost of Milk Production," copies of which may be procured by writing the State College at Ithaca. We expect to have several hundred copies of this bulletin for local distribution.

THE NEW "SANITARY CODE" ESTABLISHED BY THE PUBLIC HEALTH COUNCIL OF THE STATE OF NEW YORK

ROBERT S. BREED

CHAPTER III. MILK AND CREAM

This code recognizes four grades of milk — certified, and grades A, B and C — all of which may be sold either as raw or pasteurized milk. These grades are valid for all milk dealers who sell in any of the cities or villages of the state except New York City. The grades established are similar to those which have been used in New York City for several years, but in general the specific requirements of the state code are more lenient than are those of the city code.

The general principle upon which this law rests, namely that of grading a food product according to its quality, is fundamentally sound and as such deserves the cordial support of the institute workers and farm bureau agents. The chances for differences of opinion in regard to the advisability of the code are, in general, two:

(a) The question will be raised whether a food product should be graded according to its health quality alone, and by health officials alone. So far as health quality of a food product is concerned, the ideal condition would allow but one quality of milk on the market; namely, such as is not in any way dangerous to the public health. But grades of milk which vary according to the amount of milk solids which they contain, or grades of milk which vary according to the amount of bacterial decomposition which they have undergone, should be established and allowed on the market so far as they are not dangerous to health.

(b) It is recognized by all experts that the grades established by this code are only tentative and based upon incomplete knowledge. For this reason, it is certain that more or less objection will be raised to the code, but in reply to these objections it should be everywhere stated that all of the evidence indicates that the State Department of Health will meet this situation by a reasonable enforcement of the code.

In view of these facts, it seems to me that the producers and dealers will secure the ideal condition much more quickly by co-operation with our state officials than they will by attempting to raise legal objections and quibbling over unimportant details. At the same time every reasonable effort should be made to secure the passage of a law by the state legislature which shall put the grading of milk upon the same basis as that recognized for other food products.

FEEDING OF DAIRY PRODUCTS FROM CREAMERIES AND THE LIKE*

"A further important circumstance which contributed to the dissemination of bovine tuberculosis in the last decades is the feeding of raw milk from creameries. Bang has found with the systematic application of tuberculin, that in a number of herds in Denmark only the calves and young cattle react to tuberculin and not the older cattle. Meier-Flavenskjold, in his smaller practice in dealing with tuberculosis, has become acquainted with estates on which, as a result of feeding of raw skimmed milk from creameries, only calves react to tuberculin. He regards the Danish law passed in 1898 and 1904, requiring the pasteurizing of skim milk to suppress the transmission of tuberculosis which is bound up with the feeding of raw skimmed milk from creameries, as one of the best which has been given to agriculture. Russell reports from Wisconsin that in three creameries, the older cattle did not react to tuberculin whereas this was true to a frightful degree among young animals fed with raw skimmed milk. The danger of skimmed milk from creameries as a food for animals in comparison with the milk from individual dairies in which only its own milk is used, is dependent upon the peculiarities of the udder tuberculosis of cattle.

" The secretion of the udder of cows that are affected with tuberculosis of the udder is extraordinarily rich in tubercle bacilli. When such secretion, which in the beginning gives the impression of entirely normal milk, is mixed with thousand or even a million parts of milk of healthy cattle, the mixture is still capable of producing tuberculosis when inoculated into animals. Tuberculosis of the udder is present in about one-tenth to three-tenths per cent. of all cows. Therefore, in some dairies in which the milk of a relatively small number of cows is utilized, the probability that there is no tuberculosis of the udder among the cows is much greater than in dairies in which the milk of several hundred or even thousands of cows is daily utilized. In very large herds it is evident that, considering the percentage of the occurance of udder tuberculosis among cows, there must always be some milk coming from cows having udder tuberculosis, while in a small dairy a cow with udder tuberculosis may infect only its own calf or, at most, several calves and perhaps the pigs of the farm itself. Through the public creameries, as O. Müller justly remarks, one cow with udder tuberculosis may infect the entire young stock in any given locality. O. Müller has repeatedly noticed in East Prussia that after feeding on the skimmed milk or butter milk from a creamery which received milk from one cow with udder tuberculosis, 40 to 50 per cent. of the calves in the herds of the farmers who were associated with the given creamery, reacted to tuberculin.

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* Somewhat free translation of Ostertag's view of the dangers in the feeding of dairy products from creameries and the like, taken from Ostertag's book entitled " The Suppression of Bovine Tuberculosis," furnished by Dr. Theobald Smith, Harvard University Medical School.

"A similar observation was made in Holland. It had already been known that pigs which were fattened with the milk of a single farm were tuberculous to perhaps one-half per cent., whereas those pigs that were fed with the raw skimmed milk from large collecting creameries, were affected in larger numbers, even up to 60 to 70 per cent. A. Eber has pointed out that since the middle of the eighties of the last century, greater development of the creameries has gone hand in hand with the increase of swine tuberculosis. In Berlin, for example, according to the results of meat inspection, the number of tuberculous swine was .87 per cent. in 1885, two years after the opening of the Berlin Central Abattoir. In 1905, it had risen to 4.74 per cent. In Munich, in 1881, only .01 per cent. of 74,289 pigs were found tuberculous.

"The danger associated with the feeding of raw milk and milk products, including skimmed milk, buttermilk, and sour milk, from public creameries may be eliminated by a sufficient heating of the milk products or else the herds from which milk is sent to the creameries must be subjected to a recognized method of eliminating tuberculosis from such herds. Another way of stopping the danger associated with the creameries consist in the suggestion made by me in the year 1901, that the individual dairy send only the cream instead of the full milk to the dairies so that each owner may feed only the products of the milk of his own herd. This method has been recently warmly recommended by von Hittchen. There remains then only the adequate heating of the small amounts of butter milk as a product of the creameries in order to suppress the possibility of the dissemination of tubercle bacilli in the products of the creameries.

"In advanced udder tuberculosis, the secretion from the affected quarters may be virulent in a dilution of 1 to 1,000,000,000. In the early stage of udder tuberculosis and sometimes in the advanced stage, the content of the secretion in tubercle bacilli is less, so that a dilution of about 1 to 1,000 is enough to make a small amount of the diluted fluid harmless when injected into animals."

HAY: SEED CULTURE AND FERTILIZATION

PROFESSOR E. G. MONTGOMERY

The hay lands of New York State constitute about 5,000,000 acres, producing a crop valued at about $80,000,000. Hay land constitutes about one-third of the improved land of the state, and this crop covers almost twice as much land as the grain, truck and fruit crops combined. In value, the hay and forage crop is worth almost twice as much as all cereals and three times as much as all fruits. The following summary is taken from the 1910 census:

	Value
Cereals	$43,099,988
Other grains and seeds	3,969,022
Hay and forage	77,360,645
Vegetables (including potatoes)	36,309,544
Fruit and nuts	24,900,491
All other crops	23,528,546
Total	$209,168,236

Hay is easily our most important crop, and at least two-thirds of the crop is timothy. Regarding New York meadows there are three questions forthcoming:

1. Grass and clover mixtures, especially the use of alsike.
2. Treatment with fertilizer.
3. How to get rid of weeds.

For mixtures we have four conditions to meet, and as many mixtures to recommend in a general way:

a. Timothy and clover land.
  Timothy, 15 pounds, or 8 quarts.
  Red clover, 10 pounds, or 6 quarts.
b. Red clover uncertain.
  Timothy, 15 pounds, or 8 quarts.
  Red clover, 5 pounds, or 3 quarts.
  Alsike, 3 pounds, or 2 quarts.
c. Red clover and timothy lack uniformity.
  Timothy, 10 pounds, or 6 quarts.
  Red top, 10 pounds, or 6 quarts.
  Red clover, 5 pounds, or 3 quarts.
  Alsike, 3 pounds, or 2 quarts.
d. Land both wet and acid.
  Red top, 10 pounds, or 6 quarts.
  Alsike, 6 pounds, or 4 quarts.
For pasture other grasses should be added.

For fertilizing meadows a complete fertilizer is, as a rule, to be recommended, though in some cases good results are secured with sodium nitrate alone. Several mixtures have been used experimentally and all have shown a profit. The one we have adopted for our own meadows is as follows:

  Sodium nitrate, 4 parts by weight.
  Acid phosphate, 2 parts by weight.
  Muriate potash, 1 part by weight.
This gives a 9-4-7 mixture.

This, however, must be considered the maximum proportion of nitrogen. In many places more acid phosphate may be added, making approximately a 7-7-7 mixture.

Under favorable conditions we may apply five to six dollars' worth of fertilizer per acre, but ordinarily the farmer should not be advised to begin with more than three dollars' worth per acre. In cooperative tests this has shown a return of $1.50 to $2 for each dollar's worth of fertilizer in the hay crop — in half of the tests much better than this. In addition we must count on a residual result, in some cases doubling the above return.

Taking the above formula as a standard to work from, it may be varied to suit conditions. For the coming year we must largely eliminate potash.

Only soluble forms of fertilizers should be used as a top dressing for meadows, and should be applied as early as growth starts.

Lime, when needed, must be used before fertilizers; otherwise only small returns will usually be obtained from the fertilizer. Manure, however, will give results even when the soil lacks in lime. Its use is to be recommended.

Reference: Cornell Reading Course, Lesson 66 on "Meadows in New York."

FACTS RELATING TO HORTICULTURE

PROFESSOR C. S. WILSON

ACID PHOSPHATE FOR STRAWBERRIES

One year's experience with commercial fertilizers on strawberries at Marlborough, N. Y., suggests that in that soil acid phosphate seems to be peculiarly beneficial. These results coincide with experience elsewhere, especially in Missouri. It certainly seems safe to recommend the use of acid phosphate in amounts of 300 to 500 pounds per acre on strawberry patches wherever there is an indication that mineral fertilizers are needed. Acid phosphate can be applied on or near the plants without danger of injury, which is not true in the case of muriate of potash or nitrate of soda.

USE OF DYNAMITE IN PLANTING TREES

At the Normal Institute last year, I summarized the results of an experiment with dynamite at the New Jersey Experiment Station as follows: "Peach trees showed a large increase in top growth; also a marked increase in root growth and a wider distribution of roots in the soil. Apple trees showed very slight increase in top growth, but a marked increase in root growth. The use of dynamite did not reduce the percentage of trees that die in planting a young orchard. The careless use of dynamite may leave open spaces under the trees and also, if the blasting is done when the soil is too wet, it is liable to cause puddling."

A year ago this fall an experiment was started at Cornell, and after one season's growth the results are as follows:

Apples — average annual growth per tree, 24 trees, with dynamite, 54.6 inches.

Apples — average annual growth per tree, 16 trees, without dynamite, 51.7 inches.

Cherries — average annual growth per tree, 11 trees, with dynamite, 25.1 inches.

Cherries — average annual growth per tree, 8 trees, without dynamite, 44.6 inches.

Peaches — average annual growth per tree, 11 trees, with dynamite, 182.2 inches.

Peaches — average annual growth per tree, 8 trees, without dynamite, 109.2 inches.

No beneficial results are observed as yet in the case of the apples and cherries. There seems to be some benefit in the case of the peaches, although the differences recorded above may be due to differences in the nature of the soil. The best advice still seems to be to plant the trees in the ordinary way with a shovel, since the use of dynamite increases the cost of planting by about 100 per cent and possibly may be as injurious as beneficial.

IRRIGATION

Irrigation plants, although not at all numerous, are being constructed here and there throughout the East and the question will probably come up during the winter. In the West, where the annual rainfall is insufficient to meet the needs of the growing crops, irrigation is necessary. To what extent the practice will increase in the East remains to be seen. Thus far insufficient experimental evidence has been collected as to its real value. Probably it will never be used commercially to any extent for the tree fruits, because the annual rainfall in most of the fruit-growing districts is sufficient for the plants if the farmer practices thorough tillage. It is possible that irrigation may be beneficial in the case of the small fruits or in certain localities where the rainfall is insufficient. Irrigation has particular value in the case of the small fruits at the time of ripening, and it is at this time, often, that our dry spells come.

Until more definite results are obtained by the experiment stations in regard to the value of irrigation in the East, the grower should look to thorough tillage as the most economical source of supplying moisture to the plant.

NEW YORK APPLE GRADING AND BRANDING LAW

One of the subjects that will come up for discussion during the winter is the new apple grading and branding law, copies of which are being passed around. The institute workers should familiarize themselves thoroughly with the provisions of this law. It is not necessary here to discuss the law itself, except to explain a few topics which are most likely to come up.

The attitude of the Department of Agriculture in interpreting and enforcing this law is explained in a folder which is published by the Department at Albany, N. Y. The institute workers should procure copies of this folder.

It seems to me that the institute workers should endeavor to foster a favorable attitude on the part of the farmers toward these regulations. This law is the fruit growers' law, drawn up and endorsed by the New York State Fruit Growers' Association, the Western New York Horticultural Society and the International Apple Shippers' Association. Progressive growers have welcomed it. On the other hand, some opposition is expressed. Too good results should not be expected the first year, because it will take a few years to get the law under full headway, as in Canada it took from three to five years to put the Fruit Marks Act into effect. If the first season's results show that the law is not perfect, the attitude of the growers should be to ask for additions and changes and not a repeal.

There seems to be some confusion as to the requirements of the fourth grade, "Unclassified." The opinion prevails that all fruit not graded "Fancy" or "Standard A" or "Standard B" can be put into the "Unclassified" without further designation, as the word might imply. The law requires, however, that, even for this grade, a minimum size must be given, and if the apples are wormy, diseased or scabby, the package must be branded thus. The word "Unclassified" appears to be somewhat unfortunate, although I do not know that a better one can be found.

The requirement that "the true name of the variety" must be stamped on the package has compelled many growers to identify unknown varieties. This fall more varieties have come to the office for identification than ever before. The institute workers can state that the Geneva Experiment Station and Cornell University are glad to receive specimens for identification.

MECHANICAL GRADERS

The law has greatly stimulated the use of grading machines; in fact, it has forced the mechanical grader upon some, and questions concerning these graders will be frequent. I think it may be stated that general opinion favors the use of the grader. A year ago the department addressed letters to many growers in the state and to experiment station workers throughout the country for the purpose of ascertaining the prevailing opinion. The forty replies may be summarized as follows:

Favorable	37½%
Neutral	32½%
Unfavorable	30%

One of the growers, Mr. Willis T. Mann, writes:

"I, myself, have used a mechanical grader for the past three years with much satisfaction. During the season just past we have made our best grade a minimum size, two and one-half inches. Our second size was from two and one-eighth to two and one-half inches; those below two and one-eighth were descarded. This sizing was all done by the machine at the rate of fifty to sixty barrels per hour. The fruit is not injured in any way and the culls are picked out as they are being carried by on a moving canvas. With a machine of this kind unskilled men of fair intelligence can be used successfully in packing a reliable grade of fruit."

A local firm, Dixon Brothers, Hall, N. Y., used a Hardy grader this fall. With this grader, six or seven men can grade, size and pack two hundred barrels per day, ten hours. The machine leaves no bruises and the sizing is well done. Mr. Dixon states that the work of sizing cannot be done accurately except by machinery.

INTERSTATE LEGISLATION

An amendment to the National Food and Drugs Act, which went into effect September first, compels the marking of every package of food as to its contents in terms of weight, measure, or numerical count. The amendment applies to all boxes, barrels, crates, baskets, or food in package form used in interstate trade. The measure is of interest to fruit-growers, because it compels the marking of apple barrels and boxes. Barrels may be conveniently marked as follows:

"Minimum volume 3 bushels." Abbreviation of this to "Min. Vol. 3 bu." is probably allowable. The standard apple barrel will hold three bushels even if a cap or cushion is used. Boxes should be marked with the minimum volume and the minimum count as well. There is no regulation concerning the size of letter to be used, except that they shall be plain and easily seen. A few exceptions to the above regulations are made in case of small packages.

Copies of the amendment may be secured from the United States Department of Agriculture.

CAUTION REGARDING INDISCRIMINATE PLANTING

Attention may be called to the liability of overemphasizing the possibilities of fruit-growing in localities which may not be adapted to the industry. We are in the midst of a so-called "fruit boom," which seems to prevail everywhere. As a result of the renewal of a neglected orchard which may happen to produce a remarkable crop the first year, or of the fine crop of apples which a solitary young tree may bear, the farmers in that community often enthuse beyond reason and plant extensively without considering those factors which enter into the production of commercial crops. It seems to me that institute workers should express a caution against indiscriminate planting and should emphasize those factors which should be considered by the farmers before planting extensively, namely, temperature, moisture, soil, air drainage, slope, winds, water drainage and markets. Unreasonable plantings are, of course, more prevalent in those localities outside of the so-called "fruit regions."

FACTS RELATING TO HORTICULTURE

U. P. HEDRICK

FERTILIZERS

In 1910 this Station published a bulletin on "Fertilizers for Apples," showing that in a fifteen year experiment, profitable results had not been secured in a young apple orchard from the use of stable manure, potassium, phosphorus and nitrogen, or any combination of these ingredients. At the end of another four years we cannot change the conclusions reached in 1910; namely, that in land of average fertility, young fruit trees, at least, need little or no fertilization provided they are given thorough cultivation with cover crops plowed under each year. The following figures may be of interest. The average yield per tree for the four years just past with the different fertilizers is as follows: Stable manure, 428 pounds; phosphoric acid, 359 pounds; phosphoric acid and potassium, 424 pounds; phosphoric acid, potassium and nitrogen, 450 pounds; check, 402 pounds.

MUTATIONS

For a number of years we have tried to bring together on the station grounds all of the improved strains of old varieties of fruits in the hope that it will throw light on the much vexed question of pedigreed nursery stock. In the majority of cases, these improved strains are no better, no worse, than the varieties of which they are supposed to be improvements. Occasionally, however, we find a mutation. This year we have had fruit of a russet Bartlett pear, buds of which were sent us several years ago from Newburgh, N. Y. We have also a splendid dark red Westfield Seek-No-Further, buds of which came from Oswego, N. Y. Mr. Anderson, County Manager of Niagara County, recently sent us the best red strain of Twenty Ounce that we have yet seen. The specimens were a beautiful red, but different from the parent in no other way. These red Twenty Ounce were so similar to Opalescent, a comparatively new variety of merit, that we were at first inclined to think that they were identical, but found some differences. It seems barely possible that the Opalescent may be a red strain of Twenty Ounce. These and other instances of mutations in color show that we may expect now and then an improvement in the color of fruits through a bud sport. In all the observations we have been able to make at this station, however, we cannot say that in the matter of productiveness, quality, vigor, size or hardiness of tree, we have been able to find any differences that would warrant any man in advertising selected strains of trees as superior to the original strain in these qualities.

EUROPEAN GRAPES

In colonial times and until after the Revolutionary War, grapes were not successfully grown in the United States. Our forefathers attempted to cultivate European grapes but failed. Soon after the Revolutionary War, native grapes were domesticated and from them we have Concords, Catawbas, Delawares, Niagaras and the like. From the experiments carried on in the early days of the country, pomologists came to the conclusion that it was useless to attempt to grow European grapes. Six years ago this station grafted a number of native vines on European sorts, something over 100 of the old world varieties being used. These grafted vines have withstood the coldest winter, the hottest summer and the driest summer that we have had in a quarter of a century. Yet, about seventy-five per cent of the varieties are alive, vigorous and thrifty, and have borne four splendid crops without a miss. We have had about seventy-five varieties in fruit this year, some of which are very promising either for use as table grapes or for wine making. From the work we have done, we are certain that amateurs in New York can grow these delicious European varieties and we believe that commercial grape growers can in time make use of a considerable number of them giving them treatment somewhat modified from that given the native varieties.

NATURAL RESISTANCE TO DISEASES AND INSECTS

A number of varieties of the different fruits are relatively immune to some of our worst insect and fungous troubles. On the other hand, some sorts are very susceptible to these same insect and fungous pests. On the theory that an ounce of prevention is worth a pound of cure, farmers who have not the time to spray should be advised to plant varieties that are relatively immune to pests and diseases. The following is a very incomplete list of recommendations. The varieties of apples comparatively immune to apple scab are: Alexander, Ben Davis, Gravenstein, Grimes Golden, Hubbardston, Oldenburg, Red Astrachan, Rome, Roxbury Russet, Sutton Tolman Sweet, Tompkins King, Wealthy and Yellow Transparent. Apples fairly resistant to apple blight are: Baldwin, Delicious, Grimes Golden, Northern Spy, Tompkins King, Twenty Ounce and Wagener. Peaches most resistant to the curl leaf are: Barnard, Early Crawford, Fitzgerald, Gold Drop, Hills Chili, Kalamazoo, Late Crawford, Smock and Salway; those freest from the dreaded brown rot are, Smock, Belle of Georgia, Carman, Chairs Choice, Niagara, Salway and

Stevens. Plums freest from brown rot are: Lombard, Bradshaw, Pond, Duane, Middleburg and Field. Sweet cherries that suffer least from brown rot are: Napoleon, Wood, Windsor, Black Tartarian and Schmidts. The pears most resistant to pear blight are: Garber, Kieffer, LeConte, Seckel, Sheldon, Sudduth and Worden Seckel.

STOCKS FOR FRUITS

The question is often asked as to whether the stock influences the cion. The general opinion is that there is a reciprocal influence upon the consorting parts of a tree. A study of this subject will show that the stock may influence the cion in the following ways:

First, it modifies the form and stature of a plant, as in the case of dwarf apples and pears.

Second, a variety may be adapted to a special soil or environment by means of the stock, as, when peaches are worked on plums in heavy soils, or the reverse.

Third, through the stock, the plant may be made to endure an incompatible climate; thus, some southern apples thrive in the North when worked on hardy Hibernal or Oldenburg stocks.

Fourth, the stock, if diseased, may impart the disease to the cion; such is the case when peach stocks infected with peach yellows or little peach are budded with healthy buds.

Fifth, the productiveness of the tree is often increased by the stock through an increase in the vigor of the plant, or paradoxically enough, as in the case of dwarf apples and pears, through decreasing vigor of the plant.

Sixth, the time of maturity of both wood and crop may be changed somewhat by the stock — hastened on the one hand or retarded on the other, according to whether the stock ripens earlier or later than the cion. We are warranted in saying that earliness is promoted in the cion whenever the stock ripens its wood earlier; lateness, when the wood ripens its wood later.

Seventh, the color of a fruit may be changed by the stock; thus color is heightened by earliness and lessened by lateness in the maturity of a variety in the cases in which the stock influences the time of maturity.

Eighth, the size of a fruit is often increased by the stock. The Angouleme pear or the quince is an example familiar to all.

Ninth, the stock often affects the flavor of the fruit borne on the cion to an appreciable degree, chiefly through the change in the texture and the juice of the fruits so produced.

Tenth, some stocks shorten the life of a tree of which they are a part. Cherries on Mahaleb stocks are much shorter-lived than on Mazzard, as are also apples and pears on dwarfing stocks.

SIZE, COLOR AND QUALITY IN FRUITS

The new apple packing law in this state has brought great demand from fruit-growers to know how they can improve the size, quality and color of their fruits. To increase the size is not difficult. Generally speaking, whatever increases tree growth gives greater size to the product. To be specific, an application of nitrogenous fertilizers, plowing under leguminous cover crops, frequent and long continued cultivation — these acting singly or associatively, will increase the size of fruits. Another way of attaining greater size is by restricting the top of the plant by heavy pruning, thus getting greater growth from parts that remain. Lastly, and the best means of all, the size of almost all fruits can be greatly increased by thinning, an orchard operation so generally used that it needs no further discussion here.

It is a more difficult matter to improve the color of fruits. We know, however, that the intensive color in fruits depends largely on the amount of light. The color of fruit is often but "the burnished rays of the burning sun." Of the few means at the command of the fruit-grower to obtain better color, those having to do with securing more light are most efficient; as, pruning, greater distance apart of trees and selection of sites best exposed to the sun.

Not only does light from the sun influence the color of fruits, but solar heat has its effect. One immediately jumps to the conclusion that the warmer the weather, the brighter the colors, whereas the contrary is usually the case. We found in a study of this subject, from records of twenty-five harvests in New York, that apples usually colored especially well in seasons when they ripened in cool weather. More particularly so, if the nights were cool and the days bright and sunny. Indeed, saving numerous just exceptions and reservations, it is not too much to say that rainy weather by lowering the temperature, especially if it alternates with sunshine, may help to give high color to fruit. The cool nights of the Pacific Northwest are just as potent as the sunny days in giving color to the fruits of that region. There is a reason for the effects just ascribed to cool weather in influencing color. The chemical changes which bring about color in fruit accompany the period of ripening. Now, ripening marks the cessation of cell activities — comes with the death of cells. Color pigments are, then, waste products — the ashes of the vital fires of cells. Cold hastens the death of the cells — the ripening of fruit — and so increases color.

Nothing is more certain than that the character of the soil influences the color of fruit. Yet, what it is in soils that influences color, no one knows. The belief is current that some fertilizers affect color and we have the popular generalization that potash paints fruits, but these beliefs find no verification in fertilizer experiments. It may be stated as a general fact that whatever increases the growth of apples is antagonistic to high color. Thus, apples grown in sod are smaller and more highly colored than those grown on tilled land. So far as it is known, there are no chemicals that will influence color though it is rather generally supposed that iron and manganese have a helpful effect. Certain spraying materials, no doubt, have an influence on the color of apples and pears, chiefly because they either absorb or intensify sunlight.

Can the quality of varieties of the different fruits be changed by cultural methods? Somewhat, but not greatly. Generally speaking, whatever care and culture makes trees grow and bear normally, produces fruits of the highest quality. Food and water seem to have decided effects on quality, but what combination of these essentials is best for highest quality is a matter about which we know little. "Paul plants and Apalous waters," but God gives quality.

NEW FRUITS

Several new fruits can be recommended to fruit-growers. The Delicious, Opalescent and King David apples, all mentioned last year, have made good records this year and can be further recommended. It is doubtful, however, if any should be planted to take the place of standard commercial sorts. The Lambert cherry, a new sort from the Pacific northwest, is one of the most promising sweet varieties in our collection. Of peaches, we have nothing to say, since the crop was a general failure throughout the state this year. The June raspberry, a station seedling sent out several years ago, grows in favor more and more and promises to become the leading commercial raspberry of the state. The Marldon, sent out at the same time, and at first not so favorably received, is now looked upon by many growers as a most promising variety. The Perfection and Diploma currants and the Poorman gooseberry, all mentioned last year, have more than held their own in 1914 and made many new friends. Among strawberries, Chesapeake, Indiana, Barrymore and Prolific may be safely recommended.

PROFIT FROM AN APPLE ORCHARD

Everywhere there is demand for knowledge as to the income and outgo from apple orchards. The following data is taken as an average from an experiment running ten years in a ten-acre Baldwin apple orchard — trees twenty-nine years out at the beginning of the experiment — and ought to give a substantial foundation as to the outgo and income from an apple orchard in New York. The data, so far as possible, are given for three units, the barrel of apples, the tree and the acre.

The first information we must have is the number of barrels of apples per acre per year. The exact number for this ten-year average is 116.8 barrels. Graded, the acre average for the period is 79.2 of barreled stock, 37.6 barrels of evaporator and cider stock. Reducing these figures to the tree unit we have for barrel stock 2.93, for evaporator stock 1.4; or a total per tree of 4.33 barrels.

The first item in cost of production to be considered is interest on investment. What is a Baldwin orchard, in full bearing and in the prime of life, worth? We will suppose the value to be $500 per acre and the interest five per cent. This valuation includes not only cost of land, trees and labor, but the deferred dividends of the first twelve or fifteen years. It is sufficient, too, to cover the overhead expense of houses and barns. The first expense item, then, is $25 per acre on investment, a sum which, divided by 116.8, the number of barrels per acre, gives a charge per barrel of 21 cents as interest on investment. Since this orchard is but a part of a general farm, only an estimate can be made of the cost of taxes. There are few regions or years in New York in which taxes for such an orchard would be over $1.50 per acre, making the tax on each barrel of apples 1.2 cents.

The next account to be charged to cost of production is depreciation in teams and tools and interest on the money invested in them. First-class machinery for running the average orchard will cost in the neighborhood of $1,000, the items being as follows: Team $400, spraying outfit $250, harness $50, wagon $75, plow, harrows, ladders, crates, pruning tools, etc., $115. If we set the depreciation and interest on money at 20 per cent for the above equipment we must add 17 cents per barrel of apples to the depreciation account.

The annual cost of tillage per acre for the decade was $7.39, making the amount to be charged against each barrel of fruit 6.3 cents. The price paid for team work at the beginning of the period was $4 per day of 10 hours; but the price was advanced to $5, a fair average being $4.50. For the cover crop, in this orchard, must be added $2.74 per acre for seed, or 2.3 cents per barrel of apples. The expense of pruning per year per acre was $3.56. Since there are 27 trees to the acre in this orchard the cost per tree was 13.1 cents. The cost per barrel of apples was 3 cents. The average price paid for the work was $2 per day of 10 hours. The average cost per acre for spraying was $11.28; per tree 41.8 cents; per barrel of apples 9.6 cents. The last of the cost of production charges is that of superintending the work. The station paid for this service $300 per year. The charge to be entered for a barrel of apples for superintending is 25 cents; against the acre unit $30; against an apple tree $1.10.

Picking, packing, sorting and hauling have been done in diverse ways during the ten years and the items cannot be segregated, but the total cost of these operations has been 24.4 cents per barrel.

The following is a summary of the cost sheet for a barrel of apples:

Interest on investment	$0.21
Taxes	.012
Tilling	.063
Pruning	.03
Spraying	.096

Cover crop	$0.023
Superintending orchard	.25
Picking, packing, sorting and hauling	.244
	$0.93

The average price of barrels for ten years has been 36 cents each; the price fluctuated from 30 to 40 cents. Adding the cost of the barrel to the cost of production we have $1.29 as the total cost of a barrel of apples at the shipping point. We come now to the average price of apples for the past ten years as grown in the Auchter orchard. We have received an average of $2.60 for all the barreled stock sold, which includes firsts and seconds. For evaporator and cider stock we have received 72 cents per barrel.

We are now ready to calculate profits and declare dividends. Subtracting $1.29, the cost of a barrel of apples, from $2.60, the amount received, a net profit of $1.31 per barrel remains for firsts and seconds. Multiplying by 79, the number of barrels per acre, gives $103.49 as the profit per acre for firsts and seconds. Subtracting 72 cents from 93 cents, gives 21 cents as the difference between average cost of production and average selling price of culls. Multiplying 37.6, the number of barrels of culls per acre, by 21, gives a loss of $7.89 per acre on the culls, leaving the average net profit per acre in this orchard for the past ten years $95.60; add to this the $25 interest on the investment and we have $120.60 net, or 24.12 per cent on $500, as the annual ten-year dividend from this orchard.

INJURIOUS INSECTS OF THE ORCHARD AND GARDEN

P. J. PARROTT

THE PEAR PSYLLA

The psylla has been very abundant during the past summer and many growers have experienced considerable trouble in making any headway against it. The control of this pest in isolated orchards, or in communities where all growers unite in the effort, is most satisfactorily accomplished by making a thorough "clean up" of the adult "flies" just before they enter or just before they emerge from winter hibernation, or by destroying the eggs and young larvæ of the first brood while they are still on the branches, stems and fruit spurs or on the unopened cluster buds. The first treatment is usually the best one to adopt as it so reduces the number of hibernating flies that few eggs are laid the next spring. When adjacent orchards are neglected, however, it may be necessary to make supplementary sprayings to control invaders from neighboring unsprayed trees. See Geneva Bulletin 387, Popular Edition.

PLANT LICE OF APPLE TREES

The rosy aphis was very destructive during the early summer in apple orchards in the tier of counties bordering on the shore of Lake Ontario. Conclusive data is still lacking as to the conditions under which spraying can be most profitably conducted. On the basis of station experiments, fruit growers sustaining frequent losses from the pests are advised to spray as soon as the lice are assembled in their largest numbers on the green ends of the expanding buds. Little benefit is derived from applications when an appreciable amount of foliage is curled. The most satisfactory preparation, from the standpoint of safety to leaf tissues and effectiveness against the insects, is tobacco extract, 40-per-cent nicotine (Black Leaf 40), using three-fourths of a pint to one hundred gallons of water to which are added from three to five pounds of dissolved soap. The tobacco extract may be used with lime-sulphur, but if this is done the soap should be omitted from the combination. Kerosene emulsion and fish-oil soap at usual strengths are employed by some growers to control these insects, but such insecticides should not be added to the lime-sulphur solution. Promising combinations are soap or oil emulsion with the sulphides of sodium or potassium. See Geneva Circular 23.

THE CABBAGE MAGGOT

This insect is very destructive to seed-beds of late varieties of cabbage and to plantings of early cabbage, and it also causes great losses in radish beds. For the protection of seedlings the plants should be grown in frames, covered with cheesecloth, which method affords complete freedom from maggots and congenial conditions for growth. See Geneva Bulletin 334. Radishes thrive equally well under cloth of twenty to thirty meshes to the inch, with no danger of maggot injury. Tar pads have, in the station's experiments, afforded very efficient protection to plantings of early cabbage, and plants so protected will, during seasons favorable for the insects, grow faster and consequently "head" sooner for the early market. See Geneva Bulletin 382.

INSECTS THAT FACTOR IN THE GRADING OF APPLES

The enforcement of the "New York Apple Grading and Branding Law" has emphasized the necessity of a more careful discrimination of fruit with respect to their imperfections. As a result the past season has witnessed an unusual demand for information as regards the nature of the agents that are responsible for the disfigurement of apples. To raise the maximum amount of fruit free from defects, it is obvious that there should be a clear understanding of the destructive activities of the different orchard pests, since not all of them are susceptible to the same repressive and remedial measures. Practices that succeed against the codling moth are of no avail against apple-puncturing capsids, and injuries by the latter will continue so long as spraying operations are directed solely against the former pest. Such illustrations could be multiplied,— the point is clear and further comment is unnecessary. The injuries to apples in New York are of varying intensity, ranging from stippling with red to the occurrence of pits, scars, corky areas and blemishes of one sort and another which, with a strict enforcement of the new packing law, must have a great influence on the character of grading, if not on the market value of the fruit. Recent studies have shown that a number of species of insects as well as plant diseases are concerned in this nefarious work. Outside of areas affected by the San José scale the reddish strippling of apples appears to be due in most cases to slight or superficial infections of fungi, frequently by apple scab, and sometimes by other species, although there is evidence also for believing that quite similar discolorations may sometimes attend the puncturing of the epidermis of apples by such insects as plant lice or the apple-maggot fly. The blemishes by the codling moth are generally well known, but certain defects of apples which are not infrequently ascribed to this pest are really caused by one or more species of curculios. Many of the pitted, mishappened apples in a large number of orchards in Western New York and the Hudson River Valley are the work of red bugs; and here again some forms of injury are easily confused with those of curculios or snout beetles. Large, irregular cavities in young apples, which in healing form yellowish or brownish corky patches or areas in the mature fruit, are the result of the activities of various caterpillars known as leaf-rollers, green-fruit worms and the palmer worm. A species of caterpillar called the fruit-tree leaf-roller has, in the capacity of an apple-eating insect, done much damage to the crops of some orchards. Publications dealing with the foregoing insects are Cornell Bulletins 291 and 311, and Geneva Circular 25.

INTERNAL TREATMENT AS A MEANS OF INSECT CONTROL

From analogy with the treatment of human diseases, more or less serious efforts have been directed in the past to introduce into the sap various toxic substances to render the plant less susceptible or immune to its various parasites. Advocates of this theory of plant protection assume that the poisons are conveyed to the various tissues that compose the leaf, bark and wood, where they exert their deadly properties against the inroads of sap-sucking and leaf- and fruit-eating insects. That chemical agents, dissolved in water and absorbed by the roots, may be conveyed to the leaves and the extremities of a plant, rests on a very substantial basis of facts. However, efforts in this direction to combat grape phylloxera, plant lice and other bugs, and to cure chlorosis, have been attended with mediocre success. This subject is raised on this occasion since potassium cyanide has been recently advocated as a means of combating the San José scale, the poison being inserted into the tree by means of holes in the trunk. Experiments by this station have shown conclusively that while this and other chemicals are capable of arresting the development of this pest, such treatment is also liable to prove very injurious to the health of fruit trees.

STUDIES ON NEW SULPHUR SPRAYS

A large number of spraying mixtures which derive their insecticidal properties from sulphides and polysulphides of sodium, potassium, calcium and barium, have appeared on the market. Most of these are in liquid form, but three preparations in a powdered or granular state, containing sulphides of sodium, potassium or barium as their chief constituents, are now offered for sale. Methods for reducing lime-sulphur to a dry product are apparently known, but so far only liquid preparations of this spray can be obtained.

The amount of sulphur in proprietary insecticides of the different bases varies greatly, ranging for the sodium preparations from 1.79 to 58.92 per cent; potassium, 2.39 to 38.72 per cent; calcium, 3.97 to 26.40 per cent and barium 16.54 to 44 per cent. The variations in sulphur content and in advertised strengths for specific pests prompted comparative tests by the Geneva Station in which the sulphides were used with similar ratios of sulphur. The following results in brief form are of chief interest and importance:

With a sulphur ratio of four and three-fourths ounces of sulphur per gallon the results on scale in four commercial orchards were more or less variable; but in the main all sulphides at this strength proved quite efficient insecticides. The differences in effectiveness were such as could have been offset by more thorough spraying or by the employment of somewhat stronger mixtures.

On a basis of four and three-fourths ounces of sulphur per gallon, the relative costs of a barrel of dilute spraying mixture of the different sulphides are respectively as follows: sodium, commercial, $1.94; sodium, home-made, $.60; potassium, liver of sulphur, $4; potassium, home-made, $.76; calcium commercial, $.83; calcium, home-made, $.66; and barium, commercial, $1.49.

The more common agents that are combined with spraying mixtures to give spreading and adhering qualities are, glue, soap, glycerine, sodium silicate and oil emulsions. All these materials may be combined with the sulphides except soap and oil emulsions with the calcium and barium compounds. Promising results have been obtained by certain combinations which await confirmation by more extensive experiments.

Arsenate of lead with sulphides of sodium and potassium has generally caused more injury to foliage than when combined with the calcium and barium compounds. Without the addition of arsenate of lead the sodium and potassium preparations caused little or no discoloration of ripening cherries, plums and apples.

The salts formed by the breaking down of the different sulphides vary in their solubilities. In the case of the calcium compounds the opinion prevails that showers and rains for a short period do not materially reduce the insecticidal action of the application. Theoretically the sodium and potassium sulphides should prove more susceptible to precipitation, but experiments to this end during the past year have for the most part yielded negative results.

All the foregoing sulphides possess considerable merits as fungicides. They apparently do not have equally wide ranges of usefulness as anticryptogamics.

From considerations of economy, safeness to foliage and efficient properties against the San José scale, the station's experiments so far indicate that none of the compounds are superior to the calcium sulphides, which are the chief constituents of the lime-sulphur mixture. Experiments will be continued to determine further the distinct merits of the different sulphides and their proper fields of employment.

INJURIOUS INSECTS OF THE ORCHARD AND GARDEN

PROFESSOR C. R. CROSBY

APPLE RED BUG

There are two kinds of red bugs that have been troublesome in New York orchards during the past season, a dark red and a bright red species. The latter has been most in evidence and is responsible for the greater part of the injury. Both kinds pass the winter in the egg state in the bark of the smaller branches. The eggs of the dark red bug hatch just as the leaves of the blossom clusters are opening. The eggs of the bright red species hatch while the trees are in blossom. The young bugs feed on the leaves for a time and attack the fruit as soon as it sets, causing it to either fall, or, if it matures, to be knotty and worthless. The young bugs can be killed by thorough spraying with " Black-leaf-40 " tobacco extract, 1 pint in 100 gallons of water with 5 pounds of soap added to make the liquid stick and spread better. The tobacco extract can be used with the dilute lime-sulphur solution as used for a summer spray.* In case, however, the insects are extremely abundant, it is necessary to use such large quantities of the liquid that the lime-sulphur may injure the foliage; in such cases a separate application should be made for the red bugs, using the tobacco extract with water and soap. The application should be made first, as the blossoms begin to show pink, and second, as the last of the petals are falling. These applications coincide with those for the first scab spray and for the codling moth respectively.

APPLE LEAF-ROLLER

The apple leaf-roller has been present to a slight extent in a large proportion of the orchards of the state this year and has been very destructive in a few localities. Professor Herrick's experiments at Hilton have shown that under orchard conditions the miscible oils diluted 1/15 will kill better than 90 per cent of the eggs. The trees showed no sign of injury from such treatment. Recommendations for the control of this insect will depend on the number of egg masses present in the orchard. Where only a small number are present it will be unnecessary to use the miscible oil. Where they are very abundant the oils should be used, making the application just before the buds open. This treatment should always be followed by two very thorough applications of arsenate of lead, 6 pounds in 100 gallons of water; the first when the green tips of the first leaves show nicely and the second just before the blossom clusters separate.

THE CABBAGE APHIS

The cabbage aphis is in many seasons the most destructive insect pest with which the cabbage grower has to contend. The lice appear on the young plants soon after they are transplanted, or sometimes even in the seed beds. They multiply with great rapidity, forming dense clusters on the leaves which curl over so as to hide the lice from view and protect them from being hit by a spray. They also cluster in great numbers on the new and unexpanded leaves at the center of the plant. The growth is arrested, heading is deferred, and if the lice are sufficiently abundant the plant may be killed outright.

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* There is no objection to using this extract with the full strength mixture if the time of application is such that it will affect the aphis.

Although cabbage lice are easily killed when hit by ordinary contact insecticides, it is a difficult matter to control them economically under commercial conditions. The lice are protected in the curled leaves, where it is difficult to hit them with a spray; their bodies are covered with a white waxy bloom so that the spray does not readily wet them; and they occur in dense masses or colonies. Considerable force is required in order to reach those beneath the others. Under commercial conditions it is not possible to destroy all the lice by spraying. The best that can be expected is to so reduce their numbers that the plant will be able to continue its growth and develop the head. Efficient work can be done by spraying with the so-called whale-oil, or fish-oil soap, 10 pounds in 100 gallons of water. The first application should be made as soon as the lice begin to cluster on the young plants. At least 100 gallons should be applied to each acre when the plants are young. The most effective and economical method of application is to use an ordinary potato sprayer, equipped with a Y to which are attached two leads of hose ten or twelve feet in length. At the end of each hose is an extension rod about twenty inches long, furnished with a bordeaux or Vermorel nozzle, preferably the former. The pump should be able to maintain a pressure of at least 125 pounds. With this arrangement three men are needed, one to drive the horse and two to carry the nozzles. Attempts to use a potato sprayer with fixed nozzles have been unsuccessful. A stiff spray should be used, directed downward into the center of the plant. With a sufficient force it will be driven into many of the curled leaves and will reach the lice. The cost will be slightly over $2 an acre for each application. In some seasons three applications may be necessary.

SUMMARY OF THE NEW RECOMMENDATIONS FOR THE CONTROI OF GRAPE INSECTS

F. Z. HARTZELL

THE GRAPE ROOT-WORM

During the past five years we have conducted a large number of experiments for the control of the grape root-worm. The first season we learned that the use of 1 gallon of cheap molasses, 6 pounds of arsenate of lead and 100 gallons of water would attract the beetles, causing them to eat the poison; thus many were killed. The use of bordeaux mixture (8–8–100) and 6 pounds of arsenate of lead was found to exercise a repellent effect upon the beetles, causing them to migrate to unsprayed vines. The experiments of the following season indicated that the sweetened spray was especially deadly to the beetles, the number of eggs laid being very small.

It was learned in 1912 that the use of molasses decreased the adhesiveness of the arsenate of lead and therefore the spraying made shortly before rains were ineffective owing to the poison being washed from the foliage. A study of weather conditions during the spraying season of 1914 has enabled us to avoid rains and good results have been secured from the sweetened spray.

Another serious difficulty that was encountered was the reinfestation of a sprayed vineyard after the original beetles had been killed. There is a period just previous to oviposition when the beetles migrate a considerable distance and as they feed little at this time they are not destroyed by the sweetened spray but lay their eggs on the vines, thus in a measure reducing the value of the spray inasmuch as the entire theory of spraying to control this insect is to prevent oviposition. Vines sprayed with bordeaux mixture and arsenate of lead do not offer attractive places for egg deposition and the practice of spraying the vines with this mixture a week or ten days after the spraying with sweetened poison has resulted in splendid control of the grape root-worm. The results of the past season indicate this to be the logical procedure.

The average grape grower who sprays his vines is not apt to be very thorough. This lack of thoroughness is one of the reasons why so many vineyardists have failed to control this pest with bordeaux mixture. This use of the combined sprays as recommended above calls for care and judgment in application and it is reasonable to expect that there will be failures from its use by inexperienced persons. Our observations have revealed no vineyard in Chautauqua and Erie grape belt that has been carefully sprayed for the past five years with bordeaux mixture and arsenate of lead which is seriously infested with grape root-worm.

Bordeaux mixture has excellent qualities as a repellant and this should not be overlooked.

Recommendations:

(1) If the vineyard is moderately infested, spray with bordeaux (8-8-100) and 6 pounds of arsenate of lead shortly after the first beetles appear. Make a second application in ten days or two weeks.

(2) If the vineyard is seriously infested spray with arsenate of lead 6 pounds, cheap molasses, 1 gallon, and water, 100 gallons, being very careful to avoid spraying shortly before a rain. If several days intervene the spray will be effective. Spray within a week or ten days using bordeaux mixture (8–8–100) and arsenate of lead, 6 pounds.

CAUTION AGAINST USING NEW PREPARATIONS ON GRAPE FOLIAGE

Each season a number of new preparations, claimed by the manufacturers to be fungicides, insecticides, or both, are introduced and sold to vineyardists. Many of these are claimed to be substitutes for the bordeaux mixture and arsenate of lead. Very often such preparations are injurious to grape foliage. Unfortunately men buying such material take the word of the agent for gospel truth and instead of experimenting on a few vines with such material will spray a number of acres and cause much damage to their crop. In fairness it should be said, that such materials often have been tested by the manufacturers in other localities and on other varieties than the Concord without injuring the foliage, and immediately the conclusion is drawn that the material is harmless to grape foliage of any variety, and under different weather conditions.

Weather conditions are so important in this respect that *it is unsafe to try any material on a large scale unless it has been tested for at least five years and has been found safe under all conditions.* The safe rule to follow is *not to use any material on a large scale until the experiment stations have tried the material and proved its merits or demerits.* This is emphasized more by the fact that efficient remedies have been tried and found safe and that all such remedies are cheap and fairly easy to make and apply. From the results of many tests made at the Vineyard

Laboratory we know that materials containing calcium sulphides, sodium sulphides and perhaps other forms are decidedly injurious to Concord grapes even when applied in considerable dilution. *No grower should use any material containing sulphides on Concord grapes unless the results of competent experimenters have proven that there are exceptions to this rule.* Several manufacturers recommend, in their catalogues, lime sulphur and sodium sulphur solutions for grapes. Persons are apt to be led to spray with such materials; therefore this warning is given.

DISEASES OF FRUITS AND FARM CROPS

PROFESSOR M. F. BARRUS

BITTER PIT OR BALDWIN SPOT

This disease appeared commonly in New York State orchards this year. In some orchards there were trees on which every apple was affected. Professor McAlpine of Australia says that the disease is due to improper distribution of water by the sap-carrying vessels of the fruit at a time when it is making a rapid growth. This condition may be brought about by heavy rains following protracted dry weather. It may also be brought about by rapid change in temperature, under which conditions Bitter Pit will develop on stored apples. It may be prevented in storage by a uniform low temperature of 30 to 32 degrees F. accompanied by dry air conditions.

APPLE SCAB

This disease has been exceptionally severe this year in western and central New York, even in orchards that have received their usual good care. This condition has resulted from an abundance of infecting material on the old leaves lying under the trees and very favorable weather conditions existing in the earlier and latter part of the season. The ascospores of the fungus were disseminated from the old leaves a few days earlier than is usually the case, so that the primary infection occurred on the first leaves during May 11, 12 and 13. On these dates the buds had not developed far enough to permit a satisfactory application of spray and practically no orchards were sprayed before this date. Those who sprayed subsequently received no benefit from the fungicide.

The infected young leaves served as a source of infection during rainy weather of June 3, 4 and 7. Another infection occurred on June 19, but general dry weather during the summer checked the extent of the disease until the middle of August, when abundant late infections occurred.

The abundance of scab on the leaves this year means that the disease will be as serious or more so next year under as favorable weather conditions. The disposition of the leaves by fall plowing or in some other manner is worth consideration.

Experiments with dusting and spraying apples to control insect pests and plant diseases show that dusting with sulphur and lead arsenate gives better control than spraying except in the experiment where violent rains followed the application within a few hours. In an orchard of large Baldwin trees some of the dust mixtures proved superior to lime-sulphur solution with lead arsenate and one of the mixtures was applied at less cost per tree than was the spray.

The results of the dusting experiments covering the past four seasons, warrant the statement that the dusting method is worthy of trial in orchards where spraying at the proper time cannot be made because of weather conditions, and because of the large area to be covered.

PEACH LEAF CURL

The fact that the fruit buds of peaches were killed by last winter's low temperatures is responsible for much neglect to peach orchards during the spring and summer. Some were not sprayed at all, others carelessly sprayed and a few thoroughly sprayed. In many cases, due to rainy weather and soft ground, the application was made after the buds started. As a result there were but few orchards where no curl could be found. In many the curl caused nearly complete defoliation.

The spores are easily killed before infection occurs where either lime-sulphur 1-15 or bordeaux 3-3-50 comes in contact with them. The application to be effective must be made before the buds open. Just how long before buds open an effective application may be made is not known. It may be that it would be effective if made at any time during the dormant season.

FIRE BLIGHT

Warm, rainy weather just previous to blossoming time of apples brought about an exudation of blight bacteria from old hold-over cankers on old blighted twigs of pears and apples. The bacteria were carried to open blossoms a few days later by bees, resulting in an epidemic of apple blossom blight. The blight also became prevalent on twigs and fruit of apple as well as occurring with considerable severity on pears.

Control measures are effective but are not generally carried out for two reasons.

1. They require some knowledge of the habits of bacteria causing plant diseases.
2. They require prompt attention and thorough action at certain definite times. Very few growers are prepared to give this.

When there is a large acreage (40 acres or more) in one locality an intelligent man may be hired to spend all of his time during the season to keep the blight under control.

Keeping hold-over cankers cut out of all orchards on the farm will do much to prevent blossom blight from occurring on apples and pears.

BLOSSOM END ROT OF TOMATOES

This disease has been very prevalent in the state this year. Knowledge of the disease has been greatly increased by the extension studies of Professor Brooks, formerly of the New Hampshire Agricultural Experiment Station. He finds with others that certain varieties, as the Matchless, are much more subject to the disease than others, as Bonny Best and Stone. The disease is not due to bacteria or fungi, although various organisms may later appear in the diseased tissue. Plants are most susceptible during their period of greatest activity. It may be brought on not only by a sudden check in the water supply, as has been commonly observed, but also by continued excessive waterings. Heavy applications of stable manure also greatly increase the amount of rot. Applications of potash to liberally watered plants in the greenhouse increased the disease, but applications of either lime or nitrate of soda decreased it. Liberally watered plants growing in clay were more infected than those growing on sandy loam. From these studies we conclude that the amount of disease may be somewhat reduced by avoiding heavy applications of stable manure, by thorough preparation of soil, and subsequent cultivation in order to conserve moisture and afford a more uniform supply to the plants during the season.

DISEASES OF FRUIT AND FARM CROPS

PROFESSOR F. C. STEWART

BLISTER CANKER OF APPLE TREES

The recent studies of Mr. W. O. Gloyer, Associate Botanist of the Station, have revealed the presence of blister canker in many New York apple orchards. The mysterious death of large branches is often due to blister canker. Owing to certain peculiarities of the causal fungus (*Nummularia discreta*) the disease is not checked by the removal of affected branches. As in the case of black-rot canker, the best method of combating the disease consists in stimulating the growth of the trees by cultivation, manuring and general good care.

THIRTEEN YEARS OF POTATO SPRAYING

During thirteen consecutive years the station has conducted potato spraying experiments at Geneva. The average yield of marketable tubers on rows sprayed very thoroughly five to seven times with bordeaux mixture has been 88.6 bushels per acre greater than that on unsprayed rows.

LIME-SULPHUR VS. BORDEAUX FOR SPRAYING POTATOES

Each summer during the past four years the station has made an experiment in which lime-sulphur and bordeaux have been compared as regards their efficiency in the spraying of potatoes. Each season the result has been the same — bordeaux has greatly increased the yield while lime-sulphur has materially decreased it. The average increase in yield from the use of bordeaux is 69.3 bushels per acre, and the average decrease from the use of lime-sulphur 28.6 bushels per acre.

STEM-END BROWNING OF POTATO TUBERS

Lately there have been numerous complaints of a potato trouble in which brown streaks occur in the flesh of the tuber at the stem end. It is known that there are three or four, and perhaps more, distinct diseases which cause this stem-end browning of tubers. One of these, the Fusarium wilt, is a very troublesome disease which is quite well understood. It is transmitted through the seed, and once established, persists in the soil for several years. Something is known, also, about the Verticillium wilt; but of the other diseases which cause stem-end browning we have very little definite knowledge. Potato growers should carefully avoid planting any tubers showing stem-end browning.

SPINDLING-SPROUT DISEASE

In 1914 all Long Island potato growers using home-grown seed had more or less trouble with poor stands and weak plants. The trouble is known as "spindling-sprout" because of the very slender sprouts produced by affected seed tubers. Aside from the spindling sprouts neither the seed tubers nor the resulting plants show any symptoms of disease except that the plants are abnormally small, have slender stalks, and give very small yields. It is suspected that the exceptionally hot, dry weather in the summer of 1913 was responsible for the weakened condition of the seed tubers. This trouble has been observed previously on Long Island; also in Germany and the southern United States. It is said that progeny of affected tubers never become vigorous even when grown in northern latitudes.

CURLY-DWARF AND LEAF-ROLL

These are two potato diseases which, in the past, have been much confused with each other and with other potato diseases. It is now believed that they are distinct diseases. Both are of frequent occurrence in New York and are of considerable importance. Plants affected with curly-dwarf are short and stocky with leaves much curled and wrinkled. They die prematurely and yield only a few small tubers. In leaf-roll the leaves are rolled from the edges inward and upward, exposing the under surface. This disease appears in all degrees of severity. In severe attacks the plants are small, die prematurely and give a very small yield. Neither in curly-dwarf nor in leaf-roll are there any tuber symptoms by which affected tubers may be detected with certainty.

The absence of stem-end browning in the tubers distinguishes leaf-roll from Fusarium wilt. Both curly-dwarf and leaf-roll are hereditary physiological disorders. Both are transmitted through the seed, but, apparently, neither is communicable from one plant to another. The cause of neither is known.

SEED SELECTION

For all of the diseases above mentioned, and some others, the only practicable method of control is that of careful seed selection. So far as possible New York potato growers (excepting those on Long Island) should raise their own seed and practice some good method of seed selection. In selecting seed potatoes yield is the main thing to be considered, but some attention should be given, also, to the shape of the tubers and to the health of the foliage. Fields in which there are many missing hills or much uneveness, either as regards the size of the plants or the time of their dying, should be avoided. In most cases the potatoes in such fields are diseased or degenerating and it is doubtful if even the most careful seed selection will prevent them from running out.

COOPERATION

MARC W. COLE

If cooperation in farm activities is impracticable, then I do not know what the word cooperation means. To many the word cooperation means, "the efforts of two or more persons to a common end," or, as the dictionary has it, "The working together for any desirable end," while to others it means (and should mean to all of us if we are to apply it to farm operations) a system of business. This double meaning in the word may lead to the belief that cooperation, as a thing, is impracticable, and I wish to make clear how vast a difference there is between the two definitions of the word.

Cooperation, as a business system, must be judged as other systems are judged. Our judgment of it must take into account three important factors, viz., the individuals who undertake it, the business undertaken, and the knowledge or understanding which these individuals possess of cooperation as a business system.

Cooperation is not always successful,— no system of crop rotation always succeeds. One certainty does appear, and that is that cooperation as a system has succeeded many times and has failed only when not clearly understood or when those entering it have not felt the need, financial or social, of some sort of assistance from their fellows. To judge it by its failures is as unfair as to judge a spraying system by the cases of foliage injury, to judge a college education by some of the products of that highly desirable system, or to judge farmers' institutes by one poorly attended and poorly conducted meeting.

Briefly, a cooperative association, as a business system, is a stock company. Its stock is sold at a small sum per share — in New York State $5 per share — and the dividend on this capital stock is limited by law to the legal rate of interest. The stock voting power is limited to one vote per member regardless of the number of shares held, and the profits of the company must be divided among all those who have furnished business to the company — a patronage dividend.

The three points just enumerated should be fixed in the mind, for they eliminate all the undesirable factors which have always hampered partnerships and all other forms of stock corporations. They prevent the taking from the many for the benefit of the few and they concretely apply the gospel of " each for all and all for each." They tend to keep out the aggressive type of individual who might turn the venture to his personal advantage. They tend to make early progress of any undertaking slow, but no one will deny that the division of the profits among those who have created the profits is " a square deal."

Farmers, from the very nature of their business, are individualistic in nearly all their business relations. Not many of them, even in this day and age, are willing to consider their wives and children as partners in their business or as fellow cooperators working toward a common end. Economic forces, in this country at least, have not as yet crowded them together except in rare instances and in certain localities. Our isolation in business bred distrust and suspicion of all forms of joint undertaking for business ends, not because we have not believed in the method of the undertaking, but because we distrusted the other individuals who undertook the method. It has been only as a result of the most powerful economic pressure that farmers have undertaken either partnerships or cooperative activities.

Today changed conditions confront the farmer in the purchase of farm supplies and in the marketing of produce. After listening to the scientific injunction, " grow two blades of grass where one grew before " and after giving equal attention to the doctrine, " now spray those two blades," the farmer is lifting his head far enough above the daily task to look with reason for some method of business which will give him more profit from the " two blades."

Far-seeing men of all classes have looked at the European farmer, who, despite a heavy tax burden and a high acreage valuation on his farm, has found an answer in cooperative finance and cooperative activities. Eighteen months ago, as a result of investigations on the continent, a series of cooperative laws were passed in this state. To show their need and the result of their enactment it only needs be said that at the time of their passage there were but six cooperative companies actively working in New York State, and some of this small number were not truly cooperative as defined by these laws. Today there are over fifty cooperative associations, representing a capitalization of about $200,000. In other words, farmers on New York State farms have enough faith in the practicability of cooperation as a business system to invest $200,000 of their money into giving it a trial.

Where a group of farmers can raise $500 a successful cooperative association can be started. In the same place and with the same $500 there can be started a cooperative failure. Whichever is the result depends upon the men who go into the venture, the business each one gives to it and the number who stay in it.

Cooperative business is like a new high power spraying outfit. Its success depends upon the men who run it, the gasoline in the engine and the material in the tank. The capital is the gasoline, small in volume but great in power. The business is the quantity and quality of the material in the tank. The men in both cases must understand the machine and the method of operation; they must believe in their job and be ready to meet oft-recurring troubles. With these three factors right, we can predict success. The wind of opposition and the cold rain of doubt will not prevent a profitable crop or a profitable business.

The beginnings of a cooperative company should be small, and, among farmers, generally speaking, should be confined to the purchase of farm supplies. This should obtain because it is the simplest and easiest way to start and there is less danger of individual jealousies and friction over the standardization of farm produce which must come with the fullest cooperative effort. It is true because of the very human reason that we can more readily agree with one another on the things we must have rather than on the things we hope to have, either here or hereafter.

One company this year has profitably marketed 1,400 cars of tomatoes, receiving one check for $90,000 as one payment; another company has attempted only the purchase of lime for its members. Between these two extremes lie the main body of cooperative business in this state; all show that the system is working right in this state now. No doubt there will be some failures.

We extend a cordial invitation to attend the coming conference of cooperative associations to be held at Utica, January 13, 14 and 15, 1915.

To explain just how to start a cooperative company; to prescribe actual business operations would require more space than I am allowed, as each locality presents an individual problem — no two localities have identical conditions to meet. The first requisite in any community, however, is a meeting of those who think they are in need of a better business system. In several instances the Bureau of Cooperation has conducted five meetings before formation of a company was actually undertaken. All these meetings were primarily educational in character, given largely to explanation of the state law and to a consideration of the immediate needs of the members.

The safest method of actual business, after the organization has been perfected by these preliminary meetings, is to study the methods of other companies, either from their reports as printed in the department bulletins or by correspondence with a company doing business along similar lines. Where there is desire for cooperative work, the bureau sends an organizer, after a proper application has been made upon a prepared blank. The application blank furnishes the bureau with certain information; a local correspondent is secured who reports confidentially the work of the organizer sent out from the bureau and the local sentiment. By these methods the bureau is not only able to follow up the work of its organizers but also the growth of cooperative spirit.

In arousing local interest, the bureau owes a large debt to the grange. When members of this most excellent farmers' organization have interested themselves in the work, the labor of the bureau is made much more simple and effective. After the company is put under way, the grange people have proved themselves of great value in securing business and keeping that business on the right track.

The members of the granges, of all the people in the state, are most ready for farm cooperation. They are true cooperators; have learned all the primary lessons of the system and in almost every Grange all that is lacking is the formal organization and incorporation of an association under the statute. The patrons are rapidly learning that this new form of organization and incorporation is of immense business advantage to them and their business. It removes the individual responsibility of the purchasing committee or agent; it gives each member a stronger feeling of responsibility to the other members, and it gives them a standing in the business world which few individuals ever attain working alone and for themselves. It gives them a better and safer position when giving or asking credit and, of most importance, it removes opposition from the local dealers in farm supplies if the true Rochdale system of charging full local prices for the goods sold and distributing the profits in patronage dividends is followed.

The work done by the Bureau of Farmers' Institutes in forming various organizations among the farmers is of material value to the propaganda of cooperation. Cow testing associations, corn clubs, potato growing contests and all forms of local gatherings aid to an appreciable degree in the future establishment of a successful cooperative business.

The efforts of the county farm bureau agents in behalf of the bureau must not be overlooked, for these men have proved themselves most valuable cooperators. These agents are, for the most part, trained men who have proved themselves practical advisers and they have shown their adaptability by becoming active and successful workers for cooperation.

To sum up the whole case of cooperation in a paragraph:

Cooperation in the broadest sense means work — work with others. It means service to others and of others. It is adapted to and deals with the common affairs of life. It is practical — practical for farmers and everyone; if not, then progress is a joke and life a dream. Cooperation as defined by law and in a technical sense is a prescribed system of business; it is an evolution and growth of the stock corporation idea; it is adapted to and deals with every form of every-day business and requires only a trial under intelligent hands to prove itself.

PRACTICAL FARM COOPERATION

C. C. MITCHELL

Cooperation among farmers embraces purchasing, selling, insurance, legislative, social and financial operations.

The easiest to start are the social, legislative and insurance, as practiced by the granges. Purchasing comes next, and selling is the most difficult.

The most successful purchasing and selling societies have been organized under corporation laws, and the cooperative law in particular throws safeguards about business which in practice have been found to be very necessary.

In almost every community there is some individual or group of persons employing sound business methods in buying their supplies as nearly at wholesale as they can and selling their produce in the most effective way. A still further advantage may be secured by performing such business on a larger scale, and the advantages and responsibilities can also be most fairly distributed under the cooperative plan.

In order to secure better prices and quality on farm supplies, a study should be made of the desires of those who have them to sell, taking into account the size of orders, terms of payment, distribution of shipments throughout the year and the steadiness of the business from year to year.

To sell produce to better advantage, the requirements and demands of the market should be studied with a view to producing, packing, shipping and collecting payment in a way which will give the greatest satisfaction to the consumers, consistent with the interest of the producer. It is well to ship the most perfect articles of produce only to those who are willing to pay for the best goods, and to ship the inferior grades to people who are willing to take them for a concession in price. Individual growers have shown what can be done, even through commission merchants, by going to the cities where their goods are distributed, consulting with the commission men and observing the conditions under which the sales are made. The new public markets which have been established in New York City, and open markets in smaller towns where farmers can meet consumers directly, are worth considering, particularly as an outlet for second-grade produce.

Some of the advantages of doing business under a cooperative society are as follows:

1. The distribution of responsibility among all the members participating — not letting it rest on the purchasing agent as an individual.

2. The business standing which is given by the collective credit of all the members in a corporation.

3. The capital which may be used to finance buying and selling operations and which acts as a means of impressing upon the shareholders their responsibility.

4. The greater volume of business which can be handled by one capable head, eliminating duplication of effect, which would occur if each member were to act separately.

5. The less detail required of the persons who deal with a corporation in proportion to the amount of business done, and the less salesmanship required to get this business.

All the above-mentioned advantages result in economy and simplicity, thus making it possible to do business on a narrower margin and so effecting a saving.

Among the necessities for practical cooperation may be mentioned:

1. A determination of the members to demand a minimum of service; that is, to do everything that they possibly can for them-

selves, such as sending to their purchasing agent in advance a list of the supplies which they require, coming to the car promptly to take their goods when notified, paying cash on receipt of the same and always taking what they have agreed to take, regardless of the price at which they might be able to get it from an outside source.

2. The purchasing agent should be capable and active, have a desire to perform his duties, and receive a sufficient recompense to keep this desire alive so that he may constantly be encouraged to solicit more business from the members and to take care of it in a businesslike manner. He should receive a commission — not a salary.

3. One of the most common excuses for not buying cooperatively is the difficulty of overcoming the credit custom among members and getting them to pay cash. The saving possible to make under the average conditions in the purchase of feed, coal, fertilizer, spray materials and other supplies is from 15 to 30 per cent; so that, if farmers can only get the cash to pay for the first four or five orders, they will have saved enough to enable them to pay back the original amount — if it has been borrowed — and afterward, by using the money thus saved, to continue.

4. To make a practical start, a hint should be taken from the methods employed by fertilizer companies who send out agents at considerable expense to make a personal canvass for orders. A cooperative purchasing agent can well afford to do the same; and, by combining a sufficient number of small orders, full carloads can be made up, thus giving the smallest purchaser the same advantage as the largest. However, the amount of time and effort expended in securing and dividing small orders is almost as great as on large orders, and this expense should be charged in proportion. That is, a member who orders a full carload may be profitable to the cooperative society, even if only a half of one per cent is charged as a commission; whereas, a member who takes one-twentieth of a carload might be less profitable even though he were charged a 5 per cent commission.

5. A little practice in making up carload orders and dividing them among members will enable a purchasing agent to deter-

mine what commission should be charged in order to cover expenses, including the sending out of quotations, shortage of goods on arrival, and car service which may be charged for delay in removing goods.

Some of the cooperative societies in New York State have made a saving as high as $230 on a carload of oats costing $700. Would it not be better to pay the purchasing agent $30 on such a transaction, thus saving the members $200, rather than not to have had the purchase made? (Some dealer gets this $200 when the purchasing agent is not paid.)

COOPERATIVE SELLING

The business principles which apply in marketing farm produce are the same as those mentioned for purchasing farm supplies; and it has been found in practice that those selling societies which have begun by purchasing have thus schooled their members in the fundamental principles of cooperation, and so avoided some of the pitfalls which beset those who undertake to sell their produce together without previous experience in cooperating.

The most essential thing is the quality and pack of the produce. and next important are time and place where it is sent to be sold. Commission merchants, who are familiar with the demands of the market, have been found very useful — particularly at the beginning of operation — and because of their experience, may be the best agencies through which to sell under certain circumstances.

The same is true in regard to purchasing, for some of the grain-brokerage houses may be able to divert cars that are in transit and pick up bargains at better prices than could be secured in any other way. The diversion of cars of produce on their way to market to a point where prices are higher than that to which they were consigned is another desirable thing.

One of the most desirable things and one which is most lacking among our farmers, is storage in which to hold produce safely until it can be marketed to advantage. This same storage can frequently be utilized for holding supplies not needed for immediate use, but which can be bought at bargain prices. In a word, whatever methods have proved profitable to successful business establishments should be followed.

Federation with other cooperative groups similarly situated may be of still further advantage. In the European countries federation has been most successful in uniting a number of groups in an area corresponding to one of our counties, with also a state and a national federation.

The attitude of independent dealers, who have so long had the management of the farmers' business, should also be taken into consideration, for there are some locations in which the farmers are receiving excellent service which it might be hard for them to improve upon. On the other hand, one of the objections that has been most frequently raised is the custom among dealers of charging the same price to all customers, regardless of the quantities purchased, time when they are taken, method of delivery or terms of payment. Dealers sometimes charge a farmer who drives into their establishment with his team, pays cash and takes away a ton of feed, the same price that they deliver one bag for to a resident of the village when the dealers' team makes the delivery — credit being given at that. Dealers rarely show as much resentment toward their competitors in the same trade as they do toward the efforts of their customers who, by combining and simplifying their operations and paying cash, take their business into their own hands cooperatively.

Where cooperative societies have been in successful operation, dealers have frequently offered to sell at less than cost in order to get back trade. This is the critical period for the cooperative and all members should understand that if they do not take what they have agreed to take from their own society, it will be left on the hands of the purchasing agent, who will have difficulty in disposing of it, and there will be chance of failure. This would inevitably be followed by higher prices than before from the dealers. However, after having taken what was ordered and being given a lower price by a dealer than that last quoted by his purchasing agent, a member should always go back to his purchasing agent before placing a new order outside, as the market may have dropped. In any event the success of the cooperative will depend upon the volume and steadiness of the business which it offers to the trade.

FACTS ABOUT FARM MANAGEMENT

DR. GEORGE F. WARREN

* *Reference Bulletin* 349

For any type of farming there is a size of farm below which it is difficult to make full use of necessary tools, teams and labor. For general and dairy farms about 75 to 150 acres of crops are necessary to make full use of the necessary machinery. An even larger area of crop makes the problem simpler. When pasture land is allowed for, this usually calls for farms of 150 to 250 acres. An area up to about 400 acres is sometimes desirable but is not necessary. Additional land is exceedingly important when the crop area is less than about 75 acres. It becomes less and less important as more land is obtained. (Figs. 102, 103.)

Good crops are one of the important factors for success in farming. Yields as low as the state average can be made to pay when grown in large fields by efficient methods. But yields should be a fifth to a half better than the state average in order to make a good profit. (Fig. 104.)

Good returns per cow are as important as size of farm and even more important than good crops. Cows furnish a means of marketing farm products. They should at least pay farm prices for the labor and food consumed. With present prices of dairy products, this requires cows better than the average. To spend all summer raising a crop and then feed it to cows that do not pay their feed bill is as bad as raising a crop and then sending it to an unknown commission man who returns a bill for freight charges. The cost of keeping cows varies greatly in different parts of the state and by different methods of dairying.

If the milk is produced on pasture and little grain is fed, and if dairying is combined with cash crops so that the fullest use is made of tools and labor, it may pay to keep cows even though the returns are as low as $60 to $75 per head. With winter dairying, particularly if the farm is heavily stocked, the returns should be much more. Usually over $90 per cow is necessary if the cows

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*** This bulletin will be sent to any Farmers' Institute attendant who will write to the Director for it. The Figure numbers referred to will be found in Bulletin 349.**

are to help much. The returns have to be higher in the eastern than in the western part of the state because of high values of feed. The farmer's aim should be to get more than full market price for the time and feed for cows. A considerable number of farmers are doing this. (Tables 19 and 20.)

Live stock are a means of marketing the crop. The chief profit is usually made in growing the crop. One who does not spend as much as possible of the available time in growing crops finds it difficult to compete with farmers who do raise crops.

The amount of labor that is necessary to milk a given number of cows can milk the cows, raise their feed and in addition raise cash crops for sale. The most profitable dairy farms make use of these principles. Those who raise both the hay and grain for their cows are doing better than those who raise the roughage only. But a still more profitable way is to raise some cash crops for sale, either in addition to raising grain feed or in place of raising grain. In most parts of the state the grain for the horses should be raised, but it often pays better to raise cash crops and buy grain rather than try to raise all the grain. The cash crops also enable one to get more from the manure. It is, of course, much better to raise grain than to do nothing.

Ordinarily at least a third of the income should be from the sale of cash crops. If one has very superior cows, the cash crops are not so necessary but are nearly always desirable. (Tables 21, 22 and 24.)

In some parts of the state where grain or fruit are the leading products, the tendency is to go to the other extreme and keep too little stock. But nearly every farm has some low grade land that is best used as pasture, and practically every farm has some low grade products that are best disposed of by feeding on the farm.

During nearly half of the year darkness comes on too early to allow for a full day's work in the fields. Much time nights and mornings and stormy days is wasted if too little live stock is kept. It nearly always pays to keep some cows or other kinds of live stock.

Farms that have an animal unit for each two acres of crops are heavily stocked. One should be sure that he is right before keeping more animals than this. Farms with over five acres of crops per animal unit are very lightly stocked. One should be sure that he has a means of keeping up fertility before he goes to this extreme. (Tables 25 and 26.)

In some parts of the state there is little land that is suitable for raising crops. Pastures and hay enough to feed are about all that can be raised. Such regions should make the fullest use of the pastures. Most such regions are inclined to produce most of their milk in summer. This would seem to be the logical way to make the most of their natural conditions in regions where neither silage or grain can be raised. If conditions are right, the growing of come potatoes, vegetables, hay, fruit or other crops for sale should be encouraged in such regions. Sometimes hens, poultry or other products can be added. The two great problems in such regions are better cows and something besides milk to sell.

FARM MANAGEMENT

M. C. BURRITT

The chief points which I think ought to be emphasized with reference to farm management in this state are:

1. The making and keeping of definite farm records. This is the basis of all good farm management. Records may take the form of an annual inventory, a farm management survey, brief cash accounts and labor records, a complete system of bookkeeping, or a combination of all of these. No particular system can or should be prescribed. The one that serves the purpose; namely, to furnish definite information on which to base one's judgment of crops and enterprises and the advisability of a change, is the best.

2. The organization or reorganization of farms in accordance with known principles of successful farm management. These have been shown to be: size of farms, diversity of enterprises, crop production, efficiency in the use of labor. In teaching these principles, it is desirable to point out methods by which they may be accomplished. For example, the size of the farm business may be increased by buying more land, by clearing more of one's own land, either by drainage, clearing up fences, or other methods, by increasing the intensity of operation, by keeping more cows or growing larger crops, etc.

3. Confine teaching to farmers on farm management to principles and to illustrations of principles. Every farm is a problem of itself, although the general principles involved in its successful management are everywhere the same. We need the farm management survey in localities in order to secure definite information as to the best farm organization for that particular locality. In the absence of this definite local information it is desirable to go slow in making recommendations, except along the lines of general principles, which have been so well demonstrated by Dr. Warren. Illustrations should indicate the method of procedure in securing the solution to local farm problems and not a specific way to do it.

Cornell Bulletin No. 349 by Dr. Warren will be helpful to both.

FARM BUREAU EFFORT IN NEW YORK STATE

M. C. BURRITT

The Farm Bureau work in New York State had its beginning in the desire of a Chamber of Commerce and a railroad corporation to develop the agricultural resources of a farming community in southern New York. The advice of the college and the government was sought, and out of a conference grew a plan to employ an agricultural expert to give his whole time to work in this one locality. This was more than four years ago, and in March, 1911, Mr. John Barron became farm bureau agent in Broome county. A year later two other counties, Chemung and Jefferson, were organized, and in the late fall of 1912 and early winter of 1913, six more counties took up the work.

In every case up to this point, and in several counties subsequently organized, the work was brought about through the initiative of the local chamber of commerce with the substantial financial aid of the Federal Government, the Crop Improvement Committee of Chicago and railroad companies. It is safe to say that without assistance from these essentially non-farmer and outside agencies, which usually amounted to about $2,500 per county, the first ten counties to organize farm bureaus in New York State would probably not have had these institutions for one, and more likely two years.

When the New York Legislature of 1912 passed legislation permitting the county boards of supervisors to appropriate such county funds as they deemed advisable, to promote county agent work, they made possible the first financial support which really came from farmers. Even then for the first year it was frequently city supervisors who passed the appropriations, while the rural representatives were often indifferent or actually opposed to them. In 1913, acting upon the recommendation of the State Commissioner of Agriculture, Calvin J. Huson, the State Legislature made an appropriation of $25,000 to aid the counties directly in organizing farm bureaus, at the rate of $600 per county. The only stipulation was that the county should by some means raise an equal amount.

Thus it was that while the initiative of commercial organizations and of the Federal Government made possible the starting of this important movement in the Empire State, the state itself assured its permanence.

PROGRESS OF THE WORK

Since April, 1913, the development of the movement in the state has been rapid, and the number of bureaus has grown from nine to twenty-six, with several more about to be organized. Of the last fifteen bureaus formed, at least ten were organized by farmers, who raised three to four-fifths of the money required, and began the work without either government (except the franking privilege) or Crop Improvement Committee aid. With few exceptions, these bureaus have made as much progress in a year as was made in two years in counties where farmers were not interested, either in their finances or in their management. This progress was not so much due to the managers (agents) as to the membership and interest of the men in the county. It is an illustration of the old and sound principle of self help, which is always the most effective.

The farm bureau idea has passed the experimental stage in principal, but not in methods of work in this state. While the future of the movement is insured both by its success and by the fact that it is practically guaranteed by state and federal governments, the best methods of work, or how to get the best results for the money expended, have not yet been worked out. We are, however, learning rapidly along these lines. Undoubtedly farm bureau workers have done much that they might have left undone, and have left undone many things that they should have done. This seems a failing to which human nature is prone. Although few methods of work are yet established, we have many theories which are supported by some good evidence in facts and work accomplished, as to the lines of work which should be followed and what we should try to do. These I shall give you presently.

ORGANIZATION

Briefly the general plan of organization is about as follows: A number of citizens interested in the development of the agricultural resources of the county come together upon the call of some self-appointed leader or committee, and resolve themselves into a farm bureau of a farm improvement association, adopting a constitution and by-laws and electing officers. An executive committee or board of directors, usually consisting of seven members, is elected. Three of the officers of the association are ex-officio members of this committee, the other four being elected annually, one of whom is nominated by Pomona Grange and one of whom is nominated by the county board of supervisors. This board or committee has power to administer all the policies and finances of the association, and to employ and fix the salary of a manager. The association should have a membership of at least 500 farmers in the county, before attempting to begin the work.

A second important part of the plan is the appointment by the president, at the suggestion of the manager and with the approval of the executive committee, of an advisory council. This council is made up of persons representing each distinctive community in the county, and varies in numbers from 15 to 50. It meets quarterly to discuss with the executive committee plans and policies of the association. But the chief duties of the members of this council are in their own localities where they are local leaders of bureau effort. They help arrange for meetings and demonstrations in their respective localities, secure local memberships in the association, arrange for local help from the farm bureau manager, and cooperate, so far as possible, with him in his work in their localities.

The idea behind this general plan is first to develop local responsibility for the organization and administration of the affairs of the bureau, and then to encourage initiative on the part of each community in the county. The people of the county must first want the work done, and they must want it enough to organize and pay for it. They must plan and direct the work and seek to have done what they believe is most important. It is the old principle of self help in operation. A permanent force is established in the county which assures the continuance of local effort, if the cause is thought worth while, even though outside support is withdrawn.

Local interest and responsibility are essential in any kind of public effort for the improvement of conditions. Assistance from without has little value unless it is supplemented to local effort. This effort should be managed at home. This is the primary reason for the Farm Bureau Association. There are two good and sufficient reasons why persons should pay a dollar annual membership in a Farm Bureau Association: (1) A member helps himself when he takes an active part in the farm bureau work, as well as showing his public spirit by helping with his vote and with his influence to direct this work along right lines. The dollar guarantees the interest. (2) A member gets a direct and personal benefit to which a non-member is not entitled, by being put upon a special mailing list or exchange sales and purchase list, to receive educational and commercial information. This is paid for by the dollar which he contributes.

FINANCES

The expenses of 18 bureaus during the calendar year of 1913 amounted to $48,046.31, or approximately $2,669 for each bureau. This amount did not include the purchase of automobiles, which most of the bureaus had, and which averaged about $530 more. These figures can hardly be called averages, however, as not all of the bureaus were in operation for a full year, nor did all of them possess automobiles, even for a part of the time. More accurate data will be available after January 1, 1915. The following estimates as to the present cost of operating a farm bureau for a year, not including the purchase of an automobile, or of office rent or equipment, is approximately as follows:

Salary	$1,800
Traveling expenses	300
Office maintenance and printing	150
Stenographer	200
Auto maintenance and livery	400
Miscellaneous	150
	$3,000

The approximate cost of necessary equipment for a bureau is $800, distributed about as follows: Automobile, $500; office furniture, $100; typewriter, $75; mimeograph, $45; exhibition lantern, $60; miscellaneous, $20.

RESOURCES

Following is given the estimated resources of 25 farm bureaus in the state for the calendar year of 1914:

	Total		Average	
(1) *Local*				
Boards of supervisors	$31,600 00		$1,264 00	
Subscriptions	9,107 00		364 28	
Memberships	3,314 00		132 56	
		$44,021 00		$1,760 84
(2) *From Outside County*				
New York State	$15,000 00		*$600 00	
U. S. Government	11,820 00		473 00	
Railroad Companies	5,870 00		234 80	
		32,690 00		1,307 80
Miscellaneous, including balance from 1913		7,866 56		314 66
Grand total		$84,577 56		$3,383 30

It will be noted that an increasing amount of the financial support of the bureaus is coming from local sources, $44,021 being provided locally as against $32,690 received from outside the county. The average resources are $3,383.30 for each farm bureau during the present year. Funds from federal sources are likely to be increased during the current year. In fact, beginning August first, four other counties have received $600 each from the Federal Government; namely, Allegany, Cayuga, Oswego and Wyoming. This increases the total resources of 25 bureaus to nearly $87,000 or about $3,500 each.

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* Ten counties receive about $1,200 each, the remainder $1 and the use of the Government frank.

On January first a readjustment of federal funds will be made whereby each county in the state will receive $600 annually from the Federal Government, or at the rate of $50 per month. It is intended that newly organized counties shall receive the same amount, but we are not in a position to promise this definitely as yet, although it is probable that this amount will be available for at least five or six more counties. Six hundred dollars, or $50 a month, are available from New York State funds. These funds are paid to the counties by the Commissioner of Agriculture on recommendation of the central office. In addition to this $1,200 of public funds the government will grant the franking privilege to farm bureau managers, and most of the railroads of New York State will place the managers upon their payroll at a nominal salary of $5 per month, granting a pass over their lines in the county, and special passes on bureau business.

NATURE OF THE WORK

The kinds of work performed by the farm bureau managers and their associations are almost "too numerous to mention." They may be classified, however, into five general groups.

1. Organization of the community's forces.
2. Leadership and initiative in rural affairs.
3. Study of local economic conditions.
4. The demonstration of better farm practices and management.
5. Information and advice.

1. *Organization.*— There are two distinct kinds of organization work performed by the farm bureau managers — one commercial and the other educational. An effort is being made to differentiate between these two. Commercial organizations are chiefly buying and selling associations. The Farm Bureau Association itself is a good example of an unincorporated organization, endeavoring to bring buyers and sellers of farm supplies and products together.

The organization work of the bureau managers is, however, chiefly along educational lines, although many of these may grow into commercial projects. The best examples of this work are probably the cow testing associations, the seed improvement associations, especially of projects under way in the different counties illustrating concretely this type of work. A project means that this line of work is being carried on in the county, and does not refer to the number of farmers doing this work. The accompanying detailed tables show the number of farm bureau managers by whom the various projects were being carried on July 1, 1914:

	Projects
Farmers' exchanges	4
Cow testing associations	13
Farmers' clubs	1
Campaign for village improvement	1
Campaign for association membership	4

2. *Leadership and Initiative.*— This kind of work may mean much or little, according to the vision of the manager. The opportunities for leadership in country life and for initiative in rousing the community to develop itself to its full economic and social possibilities are many. Probably the most conspicuous needs are for cooperation along economic and educational lines: for the improvement of markets and purchasing facilities, and of roads, transportation service and rates; efficiency of churches, and schools and public institutions; the standardization of the croppage of the region, especially with reference to state and national laws, as a means of securing a square deal for the community. Boys' and girls' club work also comes under this head — not so much the actual carrying on of the work, which should be done by school superintendents and teachers, but initiative and assistance in getting it under way. The exercise of these functions generally tends to get the community to work together better. The following list of projects illustrates concretely the lines of work which are being followed in New York State:

	Projects
Boys' and girls' club work	11
Canning clubs	2
Farm contests and improvements	2
Farm Bureau picnics	4

3. *Economic Studies.*— The most important work under this function is the farm survey, as it is now commonly known, both detailed and general. The detailed surveys are carried on (1) to find out the best local farm organization and practices, (2) to

study the farm management point of view, and (3) to apply findings to individual farmers by the return of summarized records.

The introduction of cash accounts with enterprises, crops and animals, is another phase of this work, the object of which is to encourage more scientific and accurate study of the farm business.

The following list of projects illustrates this field of work in New York State:

	Projects
Farm surveys under way and completed	7
Determining the cost of production (farm accounts)	18
Rural credit	2

A new project in farm management extension was inaugurated on September first, when Professor G. P. Scoville was appointed to do demonstration work along this line with the farm bureau managers. The object of this project is to secure from 60 to 100 farm management survey records in as many of the farm bureau counties as possible, summarizing and returning the records to the farmers who furnished them. All the records are summarized, and the local data thus secured is used to demonstrate the best methods of farm organization within the county. The plan is really the application of the farm survey idea to localities and communities.

4. *Demonstrations.*— The demonstration of better farm practice in communities, with crops, animals and soils, and the improvement of these, based both on science as represented by the college and station, and on the best practice of the community as learned by definite studies, is an important line of work, and one which demands a large share of the attention of the bureau managers, as is shown by the following list of projects:

	Projects
Lime tests	7
Growth of legumes	11
Improvement of dairy cattle	2
Orchard improvement	13
Spraying (potatoes and wild mustard)	10
Drainage	13
Pasture improvement	1
Seed selection	2

5. *Information and Advice.*— From the point of view of the majority of farmers, this is the most important function of the farm bureau. Actually, it is doubtful if this function is more than incidental. However, advice and information are sought concerning nearly every conceivable subject. Certainly it is very necessary for the farm bureau manager to meet this demand of the community. Moreover, it serves to acquaint him with his people and their conditions and problems. In this respect it is of considerable value. Reliable information is needed in very many cases, but the managers are advised to go slowly in giving advice. The following projects indicate the kinds of information and advice that are usually sought:

	Projects
Fertilizer experiments and information	8
Variety tests of seed	6
The improvement of barns and other buildings	2
Extension schools, farmers' institutes, agricultural trains, etc.	7

SUPERVISION

Supervision of the farm bureaus in New York State is vested in a director and an assistant director, whose offices are located at the College of Agriculture at Ithaca. This office represents equally and is jointly supported by the Federal Department of Agriculture, through the office of the Farmers' Cooperative Demonstrations, the State Department of Agriculture and the State College of Agriculture. The following table illustrates the relationship of these institutions and the Central Office to the Bureaus:

State Department of Agriculture:
  Regulation
  Organization
  Finances

State College and Experiment Station:
  Information
  Instruction
  Extension

United States Department of Agriculture:
  Correlation
  Information
  Finances

State Director's Office:
  Information
  Organization
  Administration
  Cooperation
  Stimulation

THE TWENTY-SIX FARM BUREAUS, THEIR MANAGERS, OFFICERS AND NINE HUNDRED COMMITTEEMEN

The function of the central office of the farm bureaus, which is located in the College of Agriculture, is first to assist in the organization of new bureaus in counties which are ready for them and where their organization is desired. In organized counties the function of the central office is to administrate state and federal funds contributed to the local bureaus, to inspect and keep in close touch with the work in the several counties, assisting in this work by advice and suggestion where necessary. The central office also endeavors to correlate the work in the different counties and to work out common policies which seem most advisable. The organization and methods of work in the different counties are being constantly studied, with the view to finding out the most successful and the least successful methods.

There are many misunderstandings with reference to what the farm bureaus are trying to do, and I think it might be well to set forth some facts regarding this matter.

SOME THINGS FARM BUREAUS AIM TO DO

1. To organize communities to work together for their own interests in any way which seems desirable.

2. To remove economic handicaps in the purchase of supplies, in marketing, in transportation, etc.

3. To find out the weak spots in the farm management and the farm practice of counties and to point them out.

4. To demonstrate better methods of farm management and farm practice on farms in various communities.
5. To furnish reliable local information and agricultural facts.
6. To act as a clearing house for all other agricultural or rural institutions and to work with these agencies for the improvement of agriculture and country life.
7. To be of service to the farming community in any possible way.

SOME THINGS A FARM BUREAU IS NOT TO DO

1. To tell any farmer how to operate his farm.
2. To advise everybody about everything.
3. To advise anybody who does not ask for advice.
4. To secure the adoption of expensive or unpractical methods.
5. To revolutionize farming in any community.

HOW TO ORGANIZE A FARM BUREAU

One of the important functions of the Central Farm Bureau Office, located in the College of Agriculture, is to furnish information and assistance in the organization of farm bureaus. All inquiries which institute workers or others cannot answer positively themselves, should be referred at once to this office, which will supply the desired information and assistance.

The office has available several leaflets, which will be helpful in the organization of a bureau. Among these are: "How to Organize a Farm Bureau," "Why Pay $1 Membership in a Farm Bureau?" "What the Farm Bureau Managers are Doing," "Constitution and By-laws for Farm Bureaus."

Besides the above leaflets there are now available a number of bulletins which describe and illustrate the organization and work of the farm bureaus. Three of these are available for general distribution, namely, Circular 1, "Farm Bureaus: What They Are and How They are Organized," Circular 3, "L. H. Bailey on the Farm Bureau Movement," Circular 93 (State Department of Agriculture), "The Farm Bureau Movement in New York State." These may be obtained by addressing the Farm Bureau Department, College of Agriculture. Only a limited supply of Circular 3 is available.

In addition to these bulletins, about half the counties have local circulars or announcements, outlining the purpose and work of the local bureau. The college has begun the publication of a series of circulars describing the agriculture and the farm bureaus of the different counties. Two of these circulars are published, namely, Circular 2, Broome county; Circular 4, Jefferson county. Several others are in preparation and will be available some time during the winter.

SOME NOTES ON RECENT STATION BULLETINS FROM OUTSIDE NEW YORK STATE

F. H. HALL

ANIMAL INDUSTRY

Pa. 126.— This is a brief, popular discussion of experiments with the respiration calorimeter and other means of measuring the heat produced by food in and out of the animal body. Summarizing the results of all reported experiments in the respiration calorimeter (covering 336 days in such apparatus), the author finds a surprisingly close agreement between the heat units contained in the food and the heat produced in the body. The difference between the two sets of figures is only one-fourth of 1 per cent. This means that animal heat arises exclusively from the combustion of food in the body, and that the chemical energy is transformed into heat and work in the animal just as in artificial motors. Food is body fuel; and that part of the food which does not immediately reappear as heat or work is stored up in the body as meat, milk, etc., which may serve later to supply heat or energy for man or animal that consumes such products.

Mass. 155.— Cocoanut meal is a refuse from the extraction of the oil from cocoanut meat, is light red to brown in color, has a nutty smell and taste and is well liked by farm animals generally. It is of the same general type and same nutritive value as gluten feed, with about 20 per cent. protein, but contains more fat, ash and fiber and less carbohydrate. In feeding trials with cows it gave as good results as gluten feed, slightly increasing the amount of milk fat secreted. It makes a hard butter if more than three or four pounds daily is fed.

Mo. 114.— Work mules receiving corn and hay kept in as good condition, health and spirit as those given oats and hay, and maintained their weight slightly better. On oats, it required 4½ per cent. more feed, of which two-thirds was grain, to maintain equal weight than on corn. The mules on corn and hay did 6 per cent. more work than those on oats and hay; yet it cost one-fourth more to maintain those receiving the oats.

Md. 177.— As a result of quite extensive tests running through three years the authors find many advantages in the open stables for dairy animals. These advantages include considerably lower cost of construction and of labor, and slightly less of food, for the same production; better preservation of manure; cleaner cows and fewer bacteria in the milk; less contamination of the milk in handling because of separate milking room required in connection with the open stable; and less danger of stable accidents through slipping.

The lower temperature in the open stable was without noticeable effect on milk production, and was favorable to the milker in warm weather though a slight disadvantage in extremely cold weather.

Wis. 235.— That corn silage can be used to greater advantage than soiling crops as a supplement to summer pasture for cows has been proved by three years' experience. On silage the herd has been maintained in better condition to enter fall and winter and the profits have been greater owing to the smaller cost of the silage in labor and seed, and its advantage in feed value because of greater maturity. The soiling crops used were red clover, peas and oats, green flint corn, sweet corn, and a mixture of oats, peas and dent corn. The clover proved least palatable of all the crops fed, and the sweet corn substituted for it was most satisfactory, as the herd did better upon it than upon any other of the crops used. For preserving silage for summer use a silo of smaller diameter than usual should be provided.

Minn. Bul. 140.— This bulletin gives a vast amount of data secured in feeding and milking twenty or more cows during seven successive winters. The purpose of this work was to establish a more correct feeding standard than those in common use. On these results Prof. Haecker fixes the requirements for a 1,000-pound cow giving 24 pounds of 4½ per cent. milk as 2.07 pounds protein, 13.34 pounds carbohydrates and .64 pounds fat, practically a 1:7 ratio; and gives examples of rations to meet these needs.

Mich. Sp. 71.— Range of variation of butterfat in a cow's milk. Study of the milk records of thousands of cows for longer or shorter periods of consecutive milking show that the variation in the percentage of milk fat in the milk is greater than generally believed. In seven-day records, one-fourth of the cows in the college herd showed a variation of less than 1 per cent.; nearly half varied from 1.1 to 2 per cent., and nearly one-fourth from 2.1 to 3 per cent. while two cows varied more than 6 per cent. in this short period. Similar variations were shown by cows tested for advanced registry in both Jersey and Holstein tests, though none of these equalled the 6 per cent. range of the two cows in the college herd.

Iowa 239.— The most profitable utilization of buttermilk comes from its sale for drinking; but the amount that can be so used is inconsiderable; hence the recent development of methods by which this by-product can be converted into cheese is of interest and value. Three methods are outlined in this bulletin by which a sanitary, palatable, nutritious and economical cheese may be produced, similar to, but of smoother texture than cottage cheese.

Ill. 172.— In the tests here reported eight two-year-old high-grade Hereford steers were used and, after a preliminary period of two months under uniform conditions, were kept for thirty weeks in digestion and metabolism stalls. The figures prove that between the limits of 1:1 and 1:5 the increase of the corn meal in a ration of clover hay and corn meal leads to successively better digestion of dry matter, carbohydrates, protein and fat. The substitution of one part of linseed meal for one part of cornmeal in the 1:05 clover-hay-cornmeal ration leads to a further slight increase in the coefficients for dry substance, carbohydrates and fat and a decided increase in that for protein. With rations containing equal amounts of hay and cornmeal the digestibility of dry matter and carbohydrates decreases as the amount of fed varies from maintenance to full feed; but as the proportion of meal rises to 1:3 or 1:5 the digestibility appears greater when just enough food is given for maintenance. The coefficients for protein and fat of such rations, whether poor or rich in cornmeal, do not appear to vary with the amounts of food given; and the digestibility of none of the constituents is affected by the amounts when one part of oil meal is used with the cornmeal and hay, 1:4:1.

The general explanation for these changes in digestibility appears to lie in the increase and decrease of crude fiber with the addition or removal of hay from the rations.

Iowa 148.— Of various feed combinations tested with steers, corn silage and oil meal gave the most uniform gains and economical gains, due principally to the large amount of silage eaten by steers on this ration. The use of cottonseed meal led to a smaller consumption of silage and more expensive gain, while dried distillers' grains came between the oil meal and cottonseed meal in effectiveness. Cornmeal and oil meal gave rapid but expensive gains; and silage and shelled corn did not give satisfactory results, being too carbonaceous. The substitution of oats for shelled corn with silage proved an advantage, but the cost of production was above that from silage and oil meal.

Pa. 124.— In Pennsylvania, also, corn silage proved very economical as a feed for steers, giving better results alone than in combination with mixed hay. The silage proved so palatable for fattening steers that the amount had to be limited to make the animals eat enough ear corn to insure greatest gain during finishing period.

The use of hogs in the feed lot made a saving of $2.23 for each steer fed.

Ind. 167.— The use of corn silage with shelled corn, cottonseed meal and clover hay decreased grain consumption 2.4 pounds daily per steer and hay consumption 7.8 pounds and diminished the cost of gain $1.18 per hundred, but did not greatly affect the rate of gain.

The substitution of silage for clover hay in the ration reduced the corn consumption 2¼ pounds a day, decreased the rate of gain slightly, but diminished the cost of production 1,26 per hundred pounds. The silage detracted slightly from the finish of the steers.

The substitution of oat straw for the clover hay produced little apparent effect on the utilization of the feeds and reduced the cost of gain 42 cents a hundred. Cottonseed meal could be used with advantage up to 2½ pounds daily per thousand weight, but above that amount was less profitable.

Soy bean meal was of nearly equal value with cottonseed meal, but did not give the animals as good finish and did not serve as satisfactorily for the hogs in the feed lot The soy bean meal was a decided laxative with full-fed animals.

Wis. Research 30.— Calcium and phosphorus supply of farm feeds. Swine suffer the most of our common farm animals from deficiency of calcium; so the tests were made with pigs.

Grains are deficient in calcium but rich in phosphorus. All-grain rations would be dangerously near critical level of calcium intake for growing animals. Legumes are rich in calcium, so legume hay should be used with grain rations, or such rations should, particularly for swine, be supplemented by calcium carbonate (wood ashes), or calcium phosphate (bone ash). Ruminants on usual roughage will not ordinarily feel calcium deficiency. Milk production requires large amounts of calcium, hence demands legume forage for ash as well as for protein.

Phosphorus is usually in good supply where grains are fed liberally.

Addition of calcium carbonate or calcium phosphate increases storage of these in the body of a growing pig and produces heavier skeleton. Calcium carbonate usually has more marked influence on storage and excretion than calcium phosphate, owing to usual abundance of phosphorus in the grains fed. The deposition of calcium is shown in size of shaft of bone, not in increased length.

Ohio 271.— Experiments in Ohio prove corn, wheat middlings. linseed oil-meal, soy beans, wheat bran and rice polish unsatisfactory as sources of calcium for growing swine and indicate that rations composed of these feeds will not maintain the normal growth of bone. The pigs stored nine to ten times as much calcium from rations containing milk and meat meal as from the best one of the all-grain rations.

"The results emphasize the importance, not so much of milk and of tankage, as of pasture, forage crops and dry roughage, especially of leguminous plants, for these are our cheapest sources of those nutrients which grain foods are shown to lack." Corn was found deficient in calcium, phosphorus and nitrogen. Although phosphorus was stored on all rations it was not in sufficient amount for maximum growth.

In using rice polish and wheat bran, the large amount of magnesium appeared to cause a loss of calcium from the animals, though not in quantities to cause any deficiency in rations where these feeds were combined with others.

Soy beans, tankage or milk fed with corn appear to increase the digestibility of its starch and fat.

Ill. 168.— These experiments were very carefully made to study the development of growing pigs, as influenced by protein consumed. Analyses were made of all feeds consumed, as well as careful physical and clinical examinations of the animals used, post mortem examinations of carcasses, and physical and chemical tests and analyses of flesh, bones and organs of eight pigs.

It was found that a daily ration of ground corn, blood meal and an ample amount of calcium phosphate which contained one-third of a pound of digestible protein and 3¾ therms of metabolizable energy per 100 pounds live weight is not sufficient for the normal development of growing pigs; but such rations with 0.78 pounds of digestible protein and 4¼ therms of energy are ample for such development. Increase of these amounts by one-third and one-twentieth respectively did not exert any apparent effect upon nutrition.

Ill. 170.— In feeding swine rations including cornmeal, the digestibility of the dry matter was unchanged when middlings or red-dog flour was substituted for part of the cornmeal; was increased when pork cracklings were included with the meal alone or with the meal in combination with either of the other feeds mentioned; and was decreased when tankage was used in almost any combination of these feeds. Apparently the influence was felt mainly on the digestible protein, although there were some peculiar shiftings of digestion coefficients in the case of fat.

Kans. 192.— Two series of feeding tests were conducted, each including many variations and involving the use of large numbers of hogs. In the first series, to test the value of substitutes for, or supplements of corn, nearly four hundred animals were used, and in the second series, in which there were tests along several different lines, more than 500 hogs were fed.

In the first series the economic necessity for supplementing corn with other feeds was strikingly brought out, the results proving meat-meal and tankage the most valuable feeds on the market as additions to corn or kaffir corn, exceeding even alfalfa hay in producing large and profitable returns in fattening. When shorts cost less than one-fourth more than corn they may also be profitably used.

In the second series, the advantages of alfalfa pasture and alfalfa hay are enforced, as compared with dry-lot feeding, even though corn in the dry lot be supplemented with nitrogenous feeds like tankage, meat-meal and shorts.

Iowa 136.— The forage system for feeding pigs or young hogs is profitable in Iowa and superior to the dry-lot system. An acre of 50-bushel corn land devoted to good forage returns from $30 to $80 net profit when grazed with spring pigs. For such feeding, alfalfa makes the best permanent crop, and cheapens pork production beyond any other forage; rape makes a superior emergency crop, and is equal in merit to red clover; sweet clover is equal to red clover in its first year, but later becomes too woody for the best results; green rye makes an excellent early spring and late fall pasture, but it is not profitably " hogged down " when approaching maturity.

The ideal forage crop for swine should show, essentially: adaptation to local soil and climate; palatability; heavy yield of digestible dry matter with high protein content; a good supply of ash and small amount of fiber; a narrow nutritive ration; succulence; long pasturing season; ability to withstand grazing; permanency; reasonable cost and easy seeding; and capability of furnishing quick pasture at any time during growing season. Alfalfa, the clovers and rape furnish many of these essentials; though no one crop can give all of them.

Ohio 268.— Information may be here secured regarding oats, hominy and wheat as corn substitutes or supplements, as well as some others more commonly used in fattening swine. Oats have proven less valuable than corn; wheat or middlings no more valuable, and hominy feed of slightly greater value, when each is used with tankage.

The experience here agrees with that in Iowa, that rye should be " hogged down " only when impossible or very inconvenient to harvest it.

N. Mex. 90.— In New Mexico alfalfa pasture proved an admirable basal feed for growing pigs; but not a complete source of food supply. Skim milk alone made an excellent supplement to the alfalfa, but skim milk with a small amount of grain gave the largest returns from the alfalfa. Here a difference in ability to use and profit by pasture was noticed between different breeds; as the bacon-type swine, like Tamworths and Duroc-Tamworth crosses, made better gains at lower cost than the heavier breeds.

Ill. 169, 171, 173.— Very thorough and extensive analyses of materials and careful control of income and outgo in an elaborate series of feeding and slaughter tests of swine make it possible to give in these bulletins a most valuable collection of data relative to the ash, phosphorus and nitrogen used by growing pigs. In the feeding of the animals slaughtered — Berkshire pigs,— the amount of protein fed varied from one-third of a pound to nearly a pound daily for each hundred pounds live weight; but these variations do not affect appreciably the percentages or distribution of total or soluble ash, total water-soluble or water-soluble inorganic phosphorus, nor the nature of the nitrogenous material produced during growth.

As the animals increase in age the ash in the offal and flesh passes quite largely into the skeleton, so that pigs seven months of age show only half as large percentages of ash in offal and carcasses as those four and one-half months old; while their percentage in the skeletons is one-third larger. Similarly, the percentage of phosphorus in the skeletons of the older pigs is one-half greater than in the younger animals, although the total phosphorus in the body only increases 15 per cent. in the same time. That is, the young animal must have large amounts of ash and phosphorus in its foods, which speedily pass to a fairly permanent resting place in its skeleton.

Any deficiency of nitrogen in the ration is shown in a general shortage of protein throughout the body, not in a change in the character of the proteins produced.

Ill. 166.— This bulletin reviews the data of reported American experiments in lamb feeding and discusses them with special reference to the protein and energy requirements. The 50 experiments were made at 15 stations, with nearly 5,000 lambs, giving a vast body of data.

From these studies the authors have established the following minimum standards for feeding; expressed in amounts per thousand pounds live weight.

Weight of lambs, lbs.	Digestible protein, lbs	Net energy, therms
50–70	3.1–3.3	17–19
70–90	2.5–2.8	18–20
90–110	2.2–2.4	17–20
	2.6–3.0	16–19
110–150	1.4–1.9	16–19

Ind. 168.— Five distinct lines of investigation in lamb feeding are here reported. To test influence of silage and hay as roughage cottonseed meal as a corn supplement; value of oats for lambs; relative efficacy of barns and shed as feeding places, and influence of shearing.

The use of silage in limited quantity was found an advantage, but it could not be used as the only roughage without great care to prevent the lambs going " off feed." When clover hay alone was used as the roughage a small amount of cottonseed meal proved of some advantage; but when silage was used with the hay, the cottonseed meal was without special value, and oats in place of the cottonseed were used at a loss.

Lambs fed in a well-ventilated barn gained slightly more than those in an open shed, but they were not so well " finished " and returned less profit than those in the shed. Shearing lambs increased their appetites and induced more rapid gain, but had no effect on final profit.

Ill. 167.— It was found that corn could be made an increasingly larger part of the ration with alfalfa hay, as the feeding progressed; but it is never profitable to use over one-third more corn than hay.

POULTRY

Storrs 75.— Many careful examinations of eggs under different conditions proved that, as a rule, fresh eggs are free from bacteria, but they may become infected before leaving the ovary if this contains germs of bacillary white diarrhea. Infection from the ovary aside from this is rare; and from the oviduct very rare. Under normal conditions the shell is bacterium-proof, but when moist, and especially when moist and dirty, it may quite readily afford entrance to germs causing decay. Consequently, to avoid infection, nests should be kept sanitary and eggs be gathered as soon as possible after laying. If for long keeping, only clean eggs should be selected and should be thoroughly dry unless to be immersed in fluid preserving media. Fertilized eggs are no more subject to bacterial infection than unfertilized eggs, but may deteriorate much more rapidly because of physiological changes.

Kans. 201.— Most eggs examined showed bacteria, if at all, in yolk rather than in white, the percentage of infection varying greatly with different fowls and slightly with the age of the hen. Free range decreased the percentage of infected eggs, and feeding wet mash increased them. As at Storrs, mating did not increase bacterial infection of the eggs, the apparent increase in spoilage of fertilized eggs evidently being due to development of the embryo.

Storrs 76.— Carbon dioxide is normally present in small quantities wherever eggs are incubated, and increases from beginning to end of incubation period, except for slight decreases after first and sixteenth days. Part of the carbon dioxide should be removed by ventilation, but no injury results unless it exceeds 6 parts in 1,000 of the air. Up to 15 parts per 1,000 the effect is slight, but when the proportion is greater than this there is a marked decrease in the number of chicks hatched.

Miss. 162.— These preliminary tests are very favorable to cottonseed meal as the main source of protein for hens; since it proved palatable and profitable and without injurious effect upon the fowls when fed judiciously.

R. I. 156.—As a general conclusion the authors state that, if the constituents of bone are supplied, there appears to be no reason why cottonseed meal may not be used to furnish a considerable portion of the protein required by chicks, especially if a moderate consumption of food is satisfactory to the feeder. If most rapid growth is desired beef scraps will be found better.

N. J. 265.— Protein from a vegetable source, even with plenty of phorphorus in the ration, is not efficient in the ration for growing chickens or laying hens. The addition of meat scrap materially increases the efficiency of such a ration for both purposes and does not lead to an increased loss of nitrogen in excreta.

Phosphoric acid from an organic source (bone) is much more efficient than that from inorganic material (phosphate rock or

Hen-e-ta). The phosphorus from bone is itself better assimilated than that from rock, and promotes better assimilation of the nitrogen fed with it. The lime from bone, however, was not as well assimilated as that from Hen-e-ta. Meat scrap is a necessary adjunct to any poultry ration. Hen-e-ta is not an efficient, economical or practical material to use for any purpose in poultry feeding; dry, ground bone being a much more economical source of phosphoric acid.

A supplement to the bulletin contains several practical working rations for various purposes.

Me. 231.— This is a popular presentation of the now famous "Maine theory" of inheritance of egg-laying capacity, which ascribes to the male practically all power to transmit heavy-laying. The suggested plan for the practical breeder includes selection for constitutional vigor and vitality; use of females that have shown themselves high producers by trap-nest records; use of males only from high-producing dams, use of a pedigree system by which *male* parentage of any female is always known; making at first as many matings as possible; continued, though not too narrow, inbreeding.

Utah 135.— The record is here given of a flock of seven-year-old hens and their progeny. This flock of S. C. White Leghorns is descended from a few individuals and has consisted of from 125 to more than 200 hens each year. These hens are practically unselected for egg production, and therefore afford some index as to what ordinary flocks might be expected to do if kept through their laying life. The first and second year average for the flock was equal, 124 eggs, and that of the third year fell only a dozen eggs below this figure. For the subsequent years including the sixth, the average for all ages has been about 90 eggs. Nearly all the longer-lived hens of a flock will lay over 500 eggs, and the majority 600 to 700, with individual records reaching nearly 1,000 eggs. More hens in these flocks have made their highest year's record after the first year rather than during that year. The author would select the three-year average as the most reliable index of the value of a given hen.

W. Va. 145.— Chemical analyses and hatching tests of eggs produced under controlled conditions show definitely some facts that have practically all been accepted as matters of common observation. Among these are the increase of size of eggs with age of fowl, so that with White Leghorns eggs are heaviest in the third laying season. The average weight of eggs varies from month to month, being greatest in the spring when the birds themselves are heaviest and are laying most freely. Scanty feeding or feeding on an unbalanced ration reduces both number and size of eggs, while more liberal feeding increases both. Scanty feeding also affects hatching of eggs unfavorably.

Storrs 77.— This fourth report on white diarrhea brings out the fact that certain individuals, infected early in life and later apparently recovering, may serve throughout life as carriers of the disease germs. At least one-fourth of an infected flock may be permanent germ carriers.

The " agglutination test," in practiced hands, makes it possible to detect and remove these germ carriers.

Sour milk feeding has a most beneficial effect on growth and health of chicks, but its value in prevention or control of white diarrhea is doubtful. The artificially soured milk from cultures of Metchnikoff's *Bacillus bulgaricus* serves no better than naturally soured milk, requires time and care to make and is not as well relished by the chicks.

Minn. 132.— This is a very full and readable discussion of several phases of egg marketing; and is well worth study. No brief summary of the material would give any idea of its scope.

FIELD CROPS

Me. 224.— In tests comparing acid phosphate with Thomas' phosphate as sources of phosphoric acid in a fertilizer mixture for top dressing grass land the acid phosphate proved decidedly the better of the two in each of three seasons and have a good profit. Aside from maintaining the fertility of the soil, it is doubtful whether the Thomas phosphate was of any advantage. Comparisons of shallow planting of potatoes with high ridging, medium planting with medium ridging, and deep planting with low ridging or level culture showed the broad low ridge cultivation preferable in the southern counties, with low rainfall; while where rain was abundant, as in Aroostook Co., the differences between the methods were slight.

In a test of iron sulphate on potatoes, as it might be used to control wild mustard, most astonishing results were secured. The treated potato plants seemed as though struck by a hard freeze, but soon recovered and outyielded the untreated plants very decidedly. The author considers this result fortuitous, but thinks it possible that the check to leaf formation induced tuber production, increasing the size far beyond that of those on untreated plants.

Chemical analyses showed that summer spraying with arsenate of lead left too small an amount of poison on apples to be measurable.

Vt. 177.— With sweet peas, Hubbard squash and sweet pumpkin, lettuce, spinach, parsley, radishes and beans large seed gave earlier, larger, more uniform and better quality products. With peas little advantage was shown. The author believes seed selected with respect to size a profitable operation with most farm and garden crops.

Ind. 175.—Analyses of the maize plant and its parts were made at ten dates between June 16 and November 12. These show that all ingredients continue to increase uniformly until early in October, but with the formation of the ear the distribution of these ingredients changes. Many tables, curves and a colored plate illustrate these changes. Dry matter, crude fiber, nitrogen-free extract and starch remain practically constant in all parts of the plant but the ear, the rapid increase of these elements practically all being found in the ear.

The analyses show that under some conditions the size of a corn crop is limited by the supply of available potash; for these plants grown with ample and regular water supply, took up about as much phosphoric acid as analyses usually give the plant, about 35 per cent. more nitrogen and nearly twice as much potash. The authors believe lack of potash, through unavailability or absence of water to carry it, makes corn "chaffy."

Va. 202.—As has been proven true with many plants, the first effect of a corn cross not too extreme in nature results in an increase in yield. The crossing was secured by detasseling a portion of the plants and securing cross-fertilization by planting near these, plants of the same variety or one nearly allied, but from a different source or strain. The increase in some instances reached 30 per cent.

Mass. 154.— Tests of Grimm alfalfa proved it considerably more productive than the ordinary alfalfa, the average increase for two years being more than 20 per cent.

The average increase for two years was half a ton with the Grimm alfalfa and three-quarters of a ton with the common strain. Summer seeding gave a slightly smaller yield than spring seeding, but a greatly increased proportion of alfalfa in the hay and a decreased proportion of weeds. Use of a commercial culture for inoculating gave decidedly better yields of alfalfa the first season, but the difference disappeared with the second year. The use of the culture was profitable, though it cost $2 per acre.

Me. 229.— Of eleven varieties of oats tested for four years, in preparation for breeding work, Irish Victor, Imported Scotch, Lincoln and Prosperity gave the best average yields.

Iowa 149.— Better potato production methods for Iowa are discussed. The points particularly emphasized are the financial profit from spraying with Bordeaux and the benefit from seed selection. The gain from spraying, during three years' tests, increased markedly with the number of applications, ranging from $3.20 per acre with three sprayings to $16.46 with seven.

With Rural New Yorker potatoes, selection of the best hills increased the gain fifty bushels per acre as compared with the yield from the poorest hills; and the product from the best hills of the two lots the second season still showed as great gain for the strain started with the best hills. Early planting has given the best yield one year out of three only, midseason planting the best the other two years.

Wis. 236.— Eight years' experience with the crop indicates that soy beans will become a staple crop on the lighter sandy soils of Wisconsin; but they cannot replace alfalfa and clover on soils where these crops can be grown. The Station recommends for growth in the northern part of the state, if for seed, Wisconsin Early Black, and for forage Ito San and Medium Green. For seed production further south Early Black is advised.

Conn. 179.— In Connecticut the soy bean is not widely established, but evidently is worthy of careful testing. Varieties to be first tried are Medium Green. Medium Yellow (or Ito San) and Early White. Inoculation is recommended, but may not prove very successful the first year. Soil preferred as inoculating material as commercial cultures have not proved very satisfactory. Would use cultures if soil is not available, rather than no inoculation.

Ind. 172.— Both soy beans and cow peas succeed well in Indiana, and have a wider soil adaptation than most crops. Soy beans are preferred for grain production. Both crops will succeed on land too acid to grow clover; but such soils should be limed for best results.

Va. 205 *and* 206, *Conn.* 180, *Pa.* 130 *and Wis.* 237.— These bulletings cover most points in tobacco culture, from seed-bed to curing, and the control of diseases and insects affecting this crop. The results in Connecticut would seem specially applicable to the southern tobacco fields of New York.

Minn. 143.— Winter wheat was found inferior in baking quality to spring wheat grown under the same conditions, though the difference was not equally great in different years. Climatic conditions affect the quality of wheat much more than does soil fertility.

N. Dak. 107.—" Soil sickness " has been given as the cause of the great deterioration in wheat yields and wheat quality in North Dakota; and this bulletin of nearly 100 pages is devoted mainly to a discussion of this trouble. A remedy is proposed, which is briefly summarized as follows: One variety of pure-bred seed well graded and properly treated; infected lands purified through right crop rotation and tillage, and purified farm manures applied to the right crops. The author advises the growers not to worry about lost fertility as he believes they have not exhausted the mineral plant-food in the soil, permanently spoiled soil texture, nor stored up toxins poisonous to wheat; but have, by working in an unsanitary manner and by constant culture of wheat and allied plants, introduced into both soil and seed many wheat parasites.

SOILS

Nebr. Res. 5.— This is an exhaustive treatise upon storage and use of soil moisture, and embodies the newest theories and most approved methods. A few rather new ideas from the summary are these: In favorable seasons the soil has been practically filled with water to a depth of six or seven feet by summer tilling; a rain of one-half inch is of no value in storing moisture unless the surface is still fairly moist from a preceding rain. A mulch of several inches of hay or straw is more efficient than a soil mulch in storing water. Winter wheat uses matter to a depth of six or seven feet; alfalfa, on the particular type of soil under discussion, will obtain water from the sheet water (water level) when it is within 20 to 30 feet of the surface. It requires almost twice as much water to produce a pound of dry matter in small grain in an unfavorable season as in a favorable season.

Mich. Tech. 19.— The chemical reactions and physical laws by which soils become acid are here discussed. The main cause in sandy loam soils is held to be selective absorption, by which the basic constituents of a neutral salt solution are withdrawn. The bases absorbed by the soil combine with weak acids, forming soluble salts which are removed by leaching, when the soil is again read to " absorb " additional bases. The acidity is not due to double decomposition with absorbed acids or insoluble " humic acids."

Colo. 196.— The author discusses in as popular a way as possible, the transformations of material in the soil under the action of bacteria and similar low forms of life. No summary will take the place of a careful reading of the bulletin.

N. H. 170.— The authors hold, contrary to the usual view, that calcium carbonate and lime have practically no effect on the solubility of soil potassium; while salt, nitrate of soda, sodium carbonate and acid phosphate greatly increase its solubility.

New Hampshire soils are rich is potassium, and potassic fertilizers do not increase the yield of hay, particularly on clay soils.

N. J. 260.— Field experiments on twentieth-acre plats indicate that the average recoveries of nitrogen from nitrates, ammonium sulphate and calcium cyanamid are distinctly higher than from the same amounts of nitrogen in dried blood, fish and tankage. The average percentage of nitrogen recovered for the first crop is more than twice as high on limed as on unlimed plats, but the difference is not great for succeeding crops. The largest yields of dry matter were obtained from plats receiving manure and manure with nitrate of soda, but the percentages of nitrogen recovered from these plats are lower than from plats receiving dried blood, fish and tankage, or from those receiving green alfalfa. Plats receiving the alfalfa and nitrate of soda gave the highest yields of dry matter and highest recoveries of nitrogen.

Oregon 120, *Wis.* 204, *Mich.* 273, *Ind.* 170 *and Wis.* 205.— Improvement of sandy, clay, marsh and muck soils. With the exception of the Indiana bulletin these soil improvement bulletins discuss the matters popularly, though the advice given is based to quite an extent on investigation and experiment. They contain much suggestive and illustrative material. In the Indiana bulletin, the steps taken to improve a particular area of marsh soil are given in detail, with chemical analyses of the soil under different conditions, crop yields, etc.

Acidity was one of the chief causes of sterility in this case, but the presence of aluminum nitrate made the soil toxic, particularly to corn. It was found by growth of plants in water extract that the addition of the compounds necessary to neutralize the aluminum nitrate also made the soil productive.

In practice heavy liming and liberal use of phosphate and potash allowed the production of satisfactory crops.

HORTICULTURE

N. Hamp. 168.—A five year average of the results in an apple orchard showed insufficient increase in yields on fertilized plats over those on cultivated plats without fertilizers to warrant the use of the fertilizers. The orchard responded very positively to plowing and cultivation.

Tenn. 108.— Summer pruning of the peach, properly managed, was found to have very decided advantages in promoting formation of fruit buds, removal of unproductive and shade-producing branches, development of fruit in lower parts of trees, prevention of sun scald, and in various ways of less importance.

Ill. 175.— On brown silt loam soil, previously used for garden purposes and quite heavily manured, the use of wood ashes for onions was not found regularly profitable. Planting at the very earliest feasible date in spring (last week in March in Illinois) gave the best results. To avoid the expense of thinning, where such expense would be too great, the author recommends very careful selection of seed, thorough tests of its germinating power and extreme care in adjusting the seed drill to secure uniformly thin planting.

The advantage and disadvantage of growing onions for sets are thoroughly discussed and data given to show relative cost, during six seasons, of crops grown from seed and from sets. The profits are decidedly greater by the latter method.

W. Va. 142.— The results discussed in this bulletin were secured from three years' tests on tomatoes grown commercially for canning; and as a general conclusion the author recommends the use of not over 400 pounds to the acre of a 3-8-10 fertilizer, using nitrate as a source of nitrogen and muriate for potash; and the addition of organic matter to the soil by manure, by fall sowing of crimson clover or winter vetch in the crop previous to the tomatoes, or by substituting cow peas or soy beans for the wheat used the second year before the tomatoes.

Pa. 129.— In tests of from a dozen to two dozen or more strains of each of six varieties of tomatoes, great variations of yield were secured, in some cases reaching thirteen tons to the acre of marketable fruit. These differences are due to heredity, a factor which is more or less persistent and which acts without expense, and which should, therefore, receive as much or more attention than environmental conditions that can only be changed at considerable cost. The recommendation made is to secure seed a year in advance of the time when it will be needed, testing it out and depending on the best strains for the seed of the regular crop.

INSECTS AND DISEASES

Ill. 174.— For ease of treatment of melon lice the Station recommends " rowing " the melon and cucumber vines, by turning all shoots in the direction of the rows, a process very desirable, also, for weed destruction and moisture retention.

The application found most desirable is " Black Leaf 40," used 1 part to 500 or 600 of water, though double strength can be used without injuring foliage. The essential feature of the spray outfit is a nozzle with a bent shank to enable the operator reach the under side of the leaves, and with a fine cap to make a mist spray.

Me. 223.— While not prepared to make any general recommendation, the author finds lead arsenate very efficient as a fungicide in apple orchards, as well as insecticide, and suggests the possibility of using lime sulphur as a dorman spray only, with use of heavy applications of arsenate of lead for all spraying of foliage.

The "soluble sulphur" compound was found to give considerable spray injury.

Me. 227.— Powdery scab of potatoes, a new invader of American potato fields, is here fully described and illustrated, with figures showing other diseases and troubles which may be mistaken for it. The author considers this, without doubt, the most serious potato disease with which Maine growers have had to contend. The chief recommendations for control are thorough seed treatment with disinfectants, either one pint of formaldehyde or 4 ounces of corrosive sublimate to 30 gallons of water; and similar or more severe treatment for cleaning up storage houses, bins, bags, crates and other things that may in any way have come in contact with infected tubers.

Me. 230.— The author thinks it necessary to revise the opinion he has long held, that Rhizoctonia is not of great importance as a cause of potato troubles in Maine; as he now believes the fungus may be one of the causes of poor and uneven stands of potatoes, and "early ripening," troubles increasingly common in certain potato areas. Disinfection of seed tubers with corrosive sublimate is recommended, with shifting of potato crops from field to field annually. Formaldehyde seems ineffective as a disinfectant for this fungus.

Iowa 148.— Three years' tests prove that whole potato tubers may be treated for scab by soaking in formaldehyde solution (1 pint falmaldehyde to 30 gallons of water) or corrosive sublimate solution (2 ounces to 16 gallons water), for from 2 to 6 hours, without noticeable injury to germination. Longer soaking or delayed dying of the tubers results in injury.

Cut tubers are often severely injured.

Formaldehyde gas treatment cannot be safely used at strengths now recommended, as poor germination results.

Wis. Res. 31.— Soil treatment with formalin, 1 to 50 using two quarts per square foot of soil, destroys the "damping off" fungi, but is an expensive and slow treatment.

Soil sterilization by heat is the most satisfactory method of preventing such troubles, but may sometimes be even more expensive than the formalin treatment.

MISCELLANEOUS

Ky. 179.— This pamphlet of 80 pages contains descriptions, plans, figures, and estimates for the construction of dairy buildings of eight types, all adapted to the use of farmers of moderate means. to whom economy in construction is a main consideration.

N. Dak. 105.— Where breezes of moderate velocity blow with considerable regularity, or where stronger winds are to be expected at short intervals, windmills attached to dynamos, with storage batteries, may be found more economical sources of power than gasoline engines. The bulletin discusses in detail the conditions which would determine the applicability of this source of power, and presents some of its advantages.

Wis. 238.— Wisconsin supports more than 1,500 cooperative companies affecting agricultural interests, and agricultural cooperation is rapidly extending. The conditions necessary to the success of any cooperative effort are discussed in this bulletin, with the guidance of wide experience and the preliminary steps necessary to organization. Articles of incorporation, constitution and by-laws of a county cheese producers' association are given to aid in forming similar organizations.

Minn. 136.— Possibly there are available to sailors and mechanics more thorough discussions of some of the uses of rope, but the Minnesota Station has, in this bulletin, certainly presented to farmers a most comprehensive treatise on rope in agriculture. The pamphlet consists of 76 pages of heavy coated paper, in which are printed 180 figures illustrating the structure of ropes, knots, loops, hitches, ties, splices and arrangements for blocks and tackles, with very clear text explaining the handling of the ropes and with tables showing weight for length, breaking strength, safe load and increase of power by tackles. A good index adds to the value of the bulletin.

HOME ECONOMICS CONNECTED WITH FARM BUREAUS

KATHERINE H. MILLS

The Home Economics Department of the Erie County Farm Bureau was made possible through the efforts of the farm bureau. The Department has existed since August 8, 1914, and is the first home economics department to exist in connection with a farm bureau in the state, and so far as we know it is the first in the United States. Inasmuch as there was no appropriation for such work, the money needed to carry it on for several months was therefor raised by Mr. W. L. Markham, manager of the farm bureau, through subscriptions from individuals, banks and corporations, and was supplemented later by the membership fees of the women who joined the home economics organization of the bureau.

The efforts of the teacher in the department have been directed so far as possible with the following in mind:

1. To provide methods by which home makers can assist each other through mutual study and discussion, and at the same time add something of value to their social life.
2. To give instruction in food values, suggestions for the rearrangement of farm kitchens so as to save steps, and, in addition, to encourage the giving of increased attention to these important parts of housekeeping.
3. To bring the improved methods of housekeeping as taught in the home economics department of the College of Agriculture directly to the housekeeper.
4. To interest the younger girls in home making, and to direct their attention towards the courses in home economics that are taught in the schools of the state.
5. Through cooperation with the state canning club organizer to provide new methods of earning money for the girls on the farm.
6. To direct the attention of the rural schools to the need of provisions for warm lunches, and, whenever assistance is desired, to aid in the introduction of simple courses in domestic science in these schools.

Three-Day Domestic Science Schools.— These are held in the village in Erie county. Twelve of these schools have already been held with an average attendance of forty-eight per day, and it is proposed to hold about thirty schools each year.

Teaching in the school aims to be constructive rather than destructive, and consists of cooking demonstrations, special emphasis being put upon the underlying principles of cookery and upon the study of comparative food values. Copies of some of the standard books and magazines on household subjects are placed on exhibition, and also bulletins on subjects related to the work of home making.

At the close of the school the women are invited to become members of the home economics department of the farm bureau. The membership fee is twenty-five cents a year, and a membership card is given each woman who joins. The women in the community then elect a president, and, if their number is large, a corresponding secretary. Thus a home economics club is formed, which is expected to hold meetings at stated intervals, preparing a program. Three of these clubs are raising money to buy prizes for bread-making contests. The department has existed nearly four months and had 414 members in groups numbering from nineteen to sixty-two. The object of these clubs, besides providing means for making possible mutual study, is to further the interests of the home economics department of the farm bureau and also to provide an organization of women through whom the home economics manager may arrange future meetings. Membership in the home economics department, like membership in the farm bureau itself, is the farmers' wives' indorsement of the work of the department.

Other lines of activity are talks before granges, farmers' meetings, farmers' picnics, rural schools, and groups of rural school teachers.

Bread-Making Contests and Rural School Work.—At the invitation of the school superintendent, teacher or parents, demonstrations in cookery are given before rural schools. Two schools have already decided to include in their courses of study a series of domestic science lessons. Other schools will cooperate with the state canning club organizer in forming a canning club. Frequently the older girls are excused from their regular school work and allowed to attend the three-day domestic science school when it is held in the community. Four bread-making contests, three of them in connection with rural schools, are being carried on, with a total number of fifty-two girls under twenty-one years of age competing. The Cornell bread-making contest direction sheets are furnished to the girls who compete.

Judging from the response of the women in attending the meetings and in becoming members of the department, and also judging from the fact that the manager of the department is now booking engagements for four months in advance, it would seem that a home economic department connected with a farm bureau has a definite place in the scheme of agricultural education.

NATURE STUDY A LINK BETWEEN THE SCHOOL AND HOME

MRS. ORRA P. PHELPS

Main object of the school — to train and develop child mind.

Three important lessons not taught in text books — to observe accurately, think clearly, reason soundly.

Nature study teaches these lessons as nothing else can.

Country children need nature study. They are blind and deaf to the processes of nature. If we can arouse and foster an interest in the country, we lay the foundation for a love for the country.

Nature study is most practical. It leads to desire for further study; to an understanding of the needs of the farm. A sense of beauty is fostered by the adornment of the schoolhouse and grounds with native plants.

Conservation is taught.

Civic pride is aroused by the condition of the schoolhouse and grounds, and of the roads leading to the homes.

At home, lessons are brought to father and mother and judgment is passed upon them. Interest is aroused in school gardens, corn contests, canning clubs. If interest is aroused, both school and home profit. The home of the future, our greatest hope, will be lifted to a higher plane.

Aside from the purely practical side of nature study, it leads the child to know himself a part of all he sees; to recognize the great Master Power, and he is led through nature up to nature's God.

BOOKS FOR NATURE STUDY

Nature Study Leaflets, College of Agriculture, Ithaca...	$ .30
Nature Study and Life, by Hodge, Ginn & Co., Boston...	1.50
The Nature Study Idea, by Bailey, MacMillan Co., New York..	1.25
Sharp Eyes, Gibson, by Harper Bros., New York.......	2.50
Eye Spy, Gibson, Harper Bros., New York............	2.50
Our Ferns in their Haunts, by Clute, Stokes, New York..	2.00
How to Know the Wild Flowers, Mrs. Starr Dana......	2.00
Hand Book of Birds of Eastern North America, by Chapman, Appleton & Co., New York....................	3.00
Social Life in the Insect World, by Fabre.............	1.50
Life of the Spider, by Fabre..........................	1.50
Chapters on Plant Life, by Herrick, American Book Co..	.60
The Earth in Past Ages, by Herrick, American Book Co..	.60
First Studies of Plant Life, by Atkinson, Ginn & Co., Boston....................................	.60

REGULAR INSTITUTE WORK

With an appreciation of the fact that the holding of institutes is the chief function of the Farmers' Institute Bureau, every effort was made to keep this part of the work up to the standard of previous years, even though other lines of work had to be curtailed owing to lack of funds. In most of the counties the demand for meetings was much greater than the days allotted. In an endeavor to meet this call, twenty-one more meetings, aggregating thirty-six sessions, were held than during the previous year. That these meetings were appreciated is evidenced by the fact that the attendance shows an increase of 3,529 over the previous year. The average per session was also slightly higher.

Thirty places were visited where no meetings of the kind had been held before. Strange as it may seem, after a quarter of a century of institutes, at these meetings were a goodly number of those who had never attended a farmers institute, a large portion of whom were brought for the first time in touch with what may be termed "advanced agricultural thought and practice, or scientific agriculture."

An increased emphasis was put on the subject of farm management, a proper understanding of which is necessary to real agricultural success no matter what the line of farming.

WOMEN'S WORK

Except in a very few places a woman worker made one of the corps. Two hundred and eighty-eight special women's sessions were held. So popular have such sessions become that one will be held the coming season in connection with each institute. Two hundred and ninety-one lectures on topics relating to the home were given by the women workers at the regular sessions.

Each woman worker sent in a report from each place visited, on a blank prepared for the purpose, showing the topics discussed, attendance, and matters having particular reference to the meeting. This report also shows local conditions of the homes and environments, as indicated by the following blank.

STATE OF NEW YORK — DEPARTMENT OF AGRICULTURE

FARMERS' INSTITUTES — SEASON 1914–1915

REPORT OF WOMEN'S WORK IN FARMERS' INSTITUTES

Place........................ County......................
Date........................ Lady in Charge..............

ATTENDANCE

Special Women's Sessions: First.......... Second..........
Attendance of women at regular sessions of Institute:
First............. Second............. Third.............

SUBJECTS DISCUSSED BY LADY SPEAKER

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GENERAL REMARKS

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GENERAL CONDITIONS

Appearance..
....
....
Church..
....
Organizations...
....

EDUCATIONAL CONDITIONS

Schools ....
....
Nature Study ....
Music ....
Health ....
Library ....

HOME CONDITIONS

Social and Moral ....
....
Equipment ....
....
Sanitation ....
....
Recreation ....
....
Local Leader ....
Address ....
....

This information will materially assist in rendering more efficient service to the places in the future.

By request of the local people, Mrs. Harrington spent nine days in re-visiting places where she had been at institutes, extending the work in much more detail than was possible in a single session. Only lack of funds prevented much more work of like character.

The following list of questions prepared by a committee of women workers were sent in advance to the institute, and were used in the special women's sessions.

HOME TOPICS

Sanitation:

1. What is the first necessity in rural sanitation?
2. What is the safest way of disposing of household waste?
3. Can an earth closet be made safe?
4. What can be substituted for it?
5. Why are flies dangerous as well as annoying?
6. Is night air dangerous?
7. Are draughts dangerous?
8. How does ventilation affect health?

Health:

9. What types of disease are strictly preventable?
10. Are so-called children's diseases preventable?
11. Is it dangerous to take the breath of a person having tuberculosis or diphtheria?
12. Are colds contagious?
13. Is an unpleasant odor — as sewer gas or coal gas — a menace to health?
14. May headaches be caused by eye-strain?
15. Is there a safe headache remedy?
16. What are some of the rules for good health?

Personal Hygiene:

17. What is the best material for winter underwear?
18. What is the difference in effect between a hot and a cold bath?
19. Why is a clean mouth conducive to health?
20. Should a housekeeper take "time off" every day?

Care of Children:

21. What is the best substitute for mother's milk?
22. Is it wise to feed babies on artificial foods?
23. How long should the child have a daily bath?
24. Do irregular habits of eating and sleeping cause nervousness in children?
25. Should young babies be amused?
26. Is it safe to give babies "tastes" from the family table?
27. Should children be allowed to drink coffee or tea?
28. What constitutes a good school lunch?
29. Does candy injure the child's teeth?
30. Is water a necessary part of the child's diet?
31. Is it safe to give children patent medicines?

Food Preparation:

32. What are the general rules that govern the cooking of (a) meats, (b) eggs, (c) starchy foods, (d) vegetables?
33. What are the points in judging a loaf of bread?
34. Is it desirable to use commercial canning powders?
35. What foods are good substitutes for meat?

Equipment:

36. How do you make and use a fireless cooker?
37. What is the test of a good broom?
38. Is there a practical dish-washing machine for the private home?
39. Is paper-bag cookery practical?
40. Are paper towels, paper dish-cloths, etc., a good investment?
41. What are some of the best finishes for kitchen walls and floors?
42. Are vacuum sweepers better than the ordinary carpet sweeper?
43. Can "dustless dusters" be made at home?

INSTITUTE WORK, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE

REGULAR INSTITUTES

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
ALBANY:		1915	18	1,094	61
Coeymans Hollow	Fred R. McCarty	Jan. 7	3	158	53
Delmar	S. V. B. Haswell	Jan. 6	3	232	77
Guilderland Center	Wm. B. Mynderse	Jan. 5	3	181	60
Medusa	C. J. Waldron	1914 Dec. 1	3	228	76
Rensselaerville	H. H. Bates	Dec. 2	3	124	41
Voorheesville	R. H. Rockwell, Altamont, R. D. 3	1915 Jan. 4	3	171	57
ALLEGANY:			23	2,446	106
Almond	I. D. Karr	Feb. 23	3	269	90
Angelica	Geo. E. Shaw	Feb. 19	3	262	87
Bolivar	E. J. Phillips	Feb. 16	3	174	58
Canaseraga	Frank W. Coombs	Feb. 20	3	253	84
Caneadea	Chas. V. Mix, Fillmore, R. D. 2	Feb. 15	3	386	129
Friendship	D. P. Barnes	Feb. 17	3	316	105
Scio	Geo. M. Reynolds, Scio, R. D. 1	Feb. 18	3	366	122
Whitesville	J. C. Crittenden	Feb. 25	2	420	210
BROOME:			16	915	57
Deposit	Geo. W. Flower	Jan. 4	3	78	26
Harpursville	C. D. Wasson, Nineveh	1914 Dec. 23	2	103	52
Lisle	Curtis Day	1915 Feb. 4	3	248	83
North Colesville	S. A. Holcomb, Tunnell, R. D.	Jan. 6	2	146	73
Vestal	Lewis Haight, Vestal, R. D. 1	Jan. 9	3	139	46
Windsor	A. B. Griffin, Susquehanna, Pa., R. D. 6	Jan. 5	3	201	67
CATTARAUGUS:			26	2,812	108
Ashford Hollow	Claude L. Hughey, West Valley, R. D.	Feb. 5	3	247	82
Cattaraugus	E. C. Pritchard, Cattaraugus, R. D. 2	Feb. 3	3	361	120
Conewango	Chas. C. Mason	Jan. 28	3	246	82
Cottage	Daisy Smith, South Dayton	Feb. 1–2	5	594	119
Delevan	Elmer E. Bull	Feb. 11	3	340	113
Elkdale	W. E. Niles, Salamanca R. D. 1	Feb. 4	3	395	132
Hinsdale	Mrs. G. M. Brown	Feb. 13	3	285	95
Ischua	E. N. Williams	Feb. 12	3	344	115
CAYUGA:			27	2,045	76
Conquest	E. S. Wilcox, Port Byron, R. D. 39	Feb. 20	3	300	100
East Venice	Chas. E. Stanton, Moravia, R. D. 18	Mar. 3	3	150	50
Fair Haven	M. C. Turner	Feb. 1	3	271	90
Five Corners	H. C. Powers, Atwater	Mar. 2	3	226	75
Locke	I. J. Main	Mar. 16	3	232	77
Moravia	Arthur H. Dayton, Moravia, R. D. 59	Mar. 17	3	302	101
Port Byron	W. H. Root, Port Byron, R. D. 36	Feb. 24	3	115	38
Scipioville	E. T. Casler, Merrifield	Mar. 18	3	237	79
Sennett	W. S. Tanner, Weedsport, R. D. 42	Feb. 26	3	212	71
CHAUTAUQUA:			41	4,334	106
Arkwright	D. M. Cole, Fredonia	Jan. 18	3	200	67
Cassadaga	Henry Bramer	Jan. 19	3	380	127
Charlotte Center	Luther L. Cross, Cassadaga	Jan. 20–21	5	356	71
Cherry Creek	A. H. Blaisdell	Jan. 29–30	5	457	91
Forestville	Mrs. A. M. Keach	Jan. 13–14	5	700	140
Gerry	F. L. Ostrander	Jan. 22	3	210	70
Jamestown	A. A. Van Vleck, West Sixth street, Jamestown	Jan. 23	3	166	55
Mayville	Addie B. Dinsbier	Jan. 26	3	431	144
Niobe	O. E. Cross	Jan. 25	3	315	105
Ripley	Ora T. Little	Jan. 15–16	5	722	144
Stedman	G. G. Swart	Jan. 27	3	397	132

REGULAR INSTITUTES — *Continued*

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
CHEMUNG:			15	1,067	71
Chemung	G. M. Straitor	Mar. 10	3	181	60
Erin	E. E. Welton	Mar. 8	3	316	105
Hicks	Alton Loomis, Lockwood	Mar. 9	3	258	86
Horseheads	Clifford R. Shappee	Mar. 6	3	163	54
Veteran Grange	Geo. E. Rundle, Horseheads, R. D. 2	Mar. 5	3	149	50
CHENANGO:			19	1,336	70
Beaver Meadow	Warren A. Webb	Jan. 12	2	139	70
Greene	J. H. Lenderson	Jan. 11	3	306	102
McDonough	L. G. Conrad	Feb. 2	3	279	93
		1914			
New Berlin	A. W. Morse	Dec. 19	3	333	111
Norwich	R. A. Borland, 3 Cook Block, Norwich	Dec. 14–15	5	162	32
West Bainbridge	H. H. Lyon, Bainbridge	Dec. 22	3	117	39
CLINTON:			18	1,232	68
Altona	L. D. Hanley	Dec. 11	3	155	52
Champlain	C. R. Ashline	Dec. 12	3	123	41
Ellenburg Center	Chas. D. Watson	Dec. 10	3	351	117
Ellenburg Depot	E. A. Adams	Dec. 9	3	261	87
Morrisonville	W. H. Banker, Plattsburg, R. D. 4	Dec. 15	3	126	42
Saranac	Mrs. J. T. Hayes, Cadyville, R. D	Dec. 14	3	216	72
COLUMBIA:		1915	21	1,394	66
Claverack	Homer J. Miller	Feb. 13	3	199	66
Copake	Frank Sherman	Feb. 17	3	285	95
East Chatham	Ray R. Lant	Feb. 18	3	249	83
Livingston	Robert G. Patrie	Feb. 15	3	173	58
Mellenville	E. L. Harder, Philmont	Feb. 16	3	119	40
New Lebanon	R. M. Sumner	Feb. 19	3	225	75
Spencertown	F. C. Goodrich, East Chatham	Feb. 20	3	144	48
CORTLAND:			27	2,355	87
Cincinnatus	Arthur Cook	Feb. 1	3	380	127
Cortland	Ellis N. Reed, Cortland, R. D. 3	Jan. 30	3	244	81
Freetown Corners	Emory Cobb, Marathon	Mar. 5	3	181	60
Homer	Egbert L. Hull,	Mar. 4	3	240	80
Marathon	Manson L. Smith	Feb. 5	3	500	167
North Harford	Alton G. Parker, Harford	Mar. 6	3	182	61
Preble	Wm. W. Root	Jan. 29	3	205	68
Texas Valley	Frank G. Carter	Feb. 6	3	223	74
Willet	Harry B. Coates	Feb. 3	3	200	67
DELAWARE:		1914	24	1,495	62
Downsville	Ernest M. Dann	Dec. 8	3	156	52
East Meredith	E. E. Stebbins	Dec. 12	3	263	88
Franklin	A. W. Rowell	Dec. 11	3	388	129
Halcottsville	Amos R. Sanford	Dec. 18	3	141	47
Hancock	Chas. A. Taylor	Dec. 7	3	99	33
Sidney Center	A. M. Rutenber	Dec. 10	3	166	55
Stamford	Jos. M. Murphy	Dec. 14	3	57	19
Walton	J. Q. Barlow, Beerston	Dec. 9	3	225	75
DUTCHESS:		1915	28	1,876	67
Clinton Corners	M. E. Knapp, Millbrook	Feb. 8–9	5	370	74
Hyde Park	Benj. H. Haviland, Hyde Park, R. D	Feb. 10	3	148	49
Moores Mills	J. W. Skidmore, Pleasant Valley	Feb. 4	3	210	70
Myers Corners	O. R. Widmer, Wappingers Falls	Feb. 6	3	194	65
Pawling	Harry Wanser	Feb. 1	3	86	29
Pleasant Plains	F. M. Barker, Staatsburg	Feb. 11	3	258	86
Union Vale	Claude Abel, Verbank	Feb. 3	2	117	59
Upper Red Hook	Curtis Fraleigh, Red Hook	Feb. 12	3	261	87
Wiccopee	J. S. Warren, Hopewell Junction	Feb. 5	3	232	77

REGULAR INSTITUTES — *Continued*

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
ERIE:			27	2,969	110
Alden	E. W. Gillmore	Feb. 11	3	328	109
Bowmansville	Leo M. Parker, Forks	Jan. 9	3	242	81
Brant	Martin J. Krull, Irving, R. D.	Jan. 12	3	300	100
Chaffee	W. A. Briggs	Feb. 10	3	189	63
Clarence Center	G. D. Carmer	Jan. 8	3	577	192
Collins Center	J. W. Taft	Jan. 11	3	342	114
Griffins Mills	R. C. Grover, West Falls	Feb. 8	3	317	106
Hunters Creek	E. E. Sleeper, Holland	Feb. 9	3	209	70
Springville	W. H. Pingrey	Feb. 6	3	465	155
ESSEX:		1914	17	1,137	67
Crown Point	W. S. Green	Dec. 19	3	160	53
Jay	Mrs. Anna S. Kent	Dec. 16	3	293	98
Moriah	G. W. Witherbee, Moriah Center	Dec. 21	3	132	44
Olmstedville	F. M. La Bar, Minerva	Oct. 29	2	162	81
Westport	Irvin F. Braisted	Dec. 18	3	105	35
Willsboro	E. H. Severance	Dec. 17	3	285	95
FRANKLIN:		1915	19	1,407	74
Bombay	Geo. Rockwood	Jan. 5	3	168	56
Brushton	H. M. Aldrich, North Bangor, R. D.	Jan. 6–7	5	354	71
Chateaugay	G. N. Stuart	1914 Dec. 8	3	229	76
Ft. Covington	Mrs. M. P. Merrick	1915 Jan. 4	3	261	87
Malone	L. L. Foote, Malone, R. D. 4	Jan. 8–9	5	395	79
GENESEE:			27	2,366	88
Alexander	Earl Kidder	Feb. 13	3	300	100
Bethany Center	Harry Woolf, Linden	Feb. 12	3	326	109
Corfu	D. C. Higgins	Feb. 8	3	239	80
Darien	Nelson Harper, Darien Center	Feb. 9	3	232	77
Elba	Jos. S. Wilford	Jan. 6	3	234	78
Fort Hill	D. J. Renegar, Le Roy, R. D. 37	Feb. 25	3	348	116
Oakfield	B. W. Taylor, Batavia	Jan. 7	3	218	73
Pavilion Center	Geo. A. Branch, Pavilion, R. D.	Feb. 24	3	277	93
South Byron	W. M. Brockway	Jan. 5	3	192	64
GREENE:		1914	14	1,072	77
Freehold	R. T. Story	Nov. 30	3	153	51
Halcott Center	Myron Morse	Dec. 17	3	272	91
Leeds	D. J. Hamm	1915 Jan. 9	3	270	90
Prattsville	W. B. Chatfield	1914 Dec. 16	2	63	32
West Coxsackie	F. W. Cole. Coxsackie	1915 Jan. 8	3	314	105
HERKIMER:			20	1,094	55
Dolgeville	Arthur J. Dunckel	Mar. 8	3	78	26
Frankfort	Rufus H. Smith	Mar. 6	3	174	58
Jordanville	E. L. Walrath, Richfield Spgs., R. D. 2	Mar. 4	3	186	62
Poland	Fred Cruikshank	Mar. 9	3	216	72
Russia	Wm. H. Hughes, Barneveld, R. D.	Mar. 10	3	161	54
Van Hornesville	H. A. Mixer, Jordanville, R. D. 1	Mar. 3	2	67	34
West Winfield	Clyde T. Slade	Mar. 5	3	212	71
JEFFERSON:		1914	34	2,508	74
Adams Center	Norris L. Maltby, Adams Center R. D. 1	Dec. 4	3	338	113
Calcium	B. L. Johnson, Evans Mills	Dec. 9	3	238	79
Carthage	Eugene Lewis, Carthage, R. D. 1	Dec. 19	3	116	39
Dexter	Fred E. George, Limerick	Dec. 12	3	287	96
Henderson	Henry Bennett, Henderson, R. D. 3	Dec. 7	3	119	40

REGULAR INSTITUTES — *Continued*

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
JEFFERSON — *Concl'd:*					
Hounsfield	Chas. J. Cady, Adams Center	Dec. 8	3	248	83
La Fargeville	A. W. Beckwith	Dec. 11	3	263	88
Natural Bridge	Earl H. Allen, Natural Bridge, R. D.	Dec. 17	3	147	49
Plessis	A. W. Rowell	Dec. 15	1	18	18
Philadelphia	Rev. Elmer E. Dresser	Nov. 30	3	315	105
St. Lawrence	V. P. Comins, Clayton R. D. 3	Dec. 10	3	271	90
Theresa	Jesse A. La Fave	Dec. 14	3	148	49
LEWIS:			15	781	52
Barnes Corners	L. S. Brown, Adams, R. D. 2	Dec. 5	3	225	75
Beaver Falls	E. E. Widmyer, Castorland	Dec. 21–22	4	184	46
Denmark	Elon W. Cook	Dec. 18	1	48	48
Greig	W. J. Dominick, Lyons Falls, R. D.	Nov. 23	3	162	54
Talcottville	Oscar C. Thayer, Constableville	Nov. 24	3	137	46
West Leyden	Fred P. Grubel	Nov. 21	1	25	25
LIVINGSTON:		1915	17	1,182	70
Caledonia	Merton Phelps	Feb. 26–27	5	242	48
Conesus	Chas. McGinty	Mar. 1	3	203	68
Greigsville	K. H. Johnson	Feb. 22	3	169	56
Linwood	Neil C. McColl	Feb. 23	3	334	111
Springwater	Scott W. Swarts	Mar. 2	3	234	78
MADISON:		1914	41	2,900	71
Brookfield	C. W. Camenga, West Edmeston	Dec. 22–23	5	266	53
Canastota	Mrs. E. C. Goodell	1915 Mar. 15–16	5	239	48
De Ruyter	J. Bert Hills	Mar. 17–18	5	460	92
Earlville	N. M. Congdon	Jan. 13	3	245	82
Erieville	Mrs. T. T. Tayntor	Jan. 20	3	362	121
Fenner	J. L. O'Hara, Casenovia, R. D. 1	Mar. 16	3	260	87
Hamilton	J. G. Patterson	Jan. 14	3	133	44
Hubbardsville	F. I. Rhoades	1914 Dec. 21	3	106	35
Madison	W. T. Taylor, Solsville	1915 Jan. 18	3	141	47
Nelson	K. W. Jones	1914 Nov. 19	3	311	104
Stockbridge	C. E. Love, Munnsville	1915 Jan. 15–16	5	377	75
MONROE:			31	3,465	112
Brockport	E. W. Brigham	Feb. 26–27	5	306	61
Churchville	A. S. Hill	Jan. 4	3	259	86
Fairport	Geo. M. Case	Mar. 13	3	341	114
Gates Center	John C. Curry, Jr., Gates, R. D.	Mar. 10	3	244	81
Greece	Judson Kenyon, Barnard	Mar. 8	3	276	92
Pittsford	J. M. Todd	Mar. 12	3	261	87
Spencerport	Jas. L. Adams, Adams Basin	Mar. 9	3	297	99
Webster	Geo. W. Dunn	Mar. 5–6	5	1,259	252
West Henrietta	F. L. Martin	Mar. 11	3	222	74
MONTGOMERY:			15	876	58
Canajoharie (Seeber's Lane Grange)	C. L. St. John, Canajoharie	Feb. 27	3	197	66
Freysbush	J. F. Hiller, Fort Plain	Mar. 1	3	236	79
Glen	C. T. Van Horne	Feb. 25	3	117	39
Minaville	Howard A. Hewett	Feb. 24	3	230	77
St. Johnsville	Lou D. MacWethy	Mar. 2	3	96	32
NASSAU:			4	243	61
Mineola	L. R. Simons	Jan. 20–21	4	243	61

REGULAR INSTITUTES — *Continued*

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
NIAGARA:			24	3,498	146
Barker	J. J. Connolly	Mar. 1	3	433	144
Johnsons Creek	W. W. Prudom, Middleport, R. D. 38	Feb. 19	3	526	175
Middleport	Frank C. Densberger	Feb. 20	3	254	85
Newfane	Elma McKee	Feb. 18	3	274	91
Pekin	Chas. E. Mabon, Sanborn	Feb. 16	3	572	191
Pendleton Center	L. J. P. Richards, Lockport, R. D. 4	Feb. 15	3	368	123
Ransomville	W. D. Wisner	Feb. 17	3	466	155
Rapids	C. H. Burdick, Lockport, R. D. 6	Feb. 22	3	605	202
ONEIDA:		1914	18	1,068	59
Boonville	Silas B. Sherman	Nov. 20	3	85	28
Camden	W. G. Seubert, McConnellsville	Nov. 30	3	280	93
Knoxboro	Chas. D. Fairchild, Oriskany Falls, R. D.	1915 Jan. 19	3	287	96
Marcy	H. A. Humphrey	Mar. 11	3	151	50
Rome	Wm. A. Searle, Chamber of Commerce, Rome	Mar. 13	3	133	44
Sauquoit	S. W. Smith, R. D. 2, Sauquoit	Mar. 12	3	132	44
ONONDAGA:		1915	31	2,832	91
Baldwinsville	Burt Giddings	Jan. 22–23	5	562	112
Borodino	Ellis Patterson	Jan. 26	3	282	94
Camillus	V. D. Kasson, Camillus, R. D. 2	Jan. 25	3	160	53
Jordan	H. J. Rickard, Jordan, R. D. 1	Feb. 25	3	181	60
La Fayette	Wm. H. Park, La Fayette, R. D. 3	Jan. 28	3	201	67
Lysander	W. N. Reddout	Jan. 25	3	364	121
Manlius	C. F. Ferris	Jan. 22–23	5	374	75
North Manlius	M. J. Costello, Kirkville, R. D 1	Jan. 21	3	307	102
South Onondaga	A. B. Fenner, Syracuse, R. D. 5	Jan. 27	3	401	134
ONTARIO:			24	2,171	90
Bristol Springs	Elmer N. Coye, Naples	Mar. 5	3	261	87
Farmington	Jos. I. Green, Macedon, R. D. 1	Feb. 17	3	295	98
Manchester	R. R. McLouth, Shortsville	Feb. 5	3	213	71
Naples	M. M. Wheeler	Mar. 4	3	169	56
Phelps	F. A. Salisbury	Feb. 4	3	228	76
Reed Corners	James Roat, Canandaigua	Feb. 6	3	348	116
Victor	A. G. Aldridge	Feb. 16	3	465	155
West Bloomfield	Chas. W. Duffy	Feb. 15	3	192	64
ORANGE:			20	1,275	64
Balmville	Gurnsey Sheeley, Newburg, R. D. 1	Jan. 18	3	166	55
Bullville	I. V. Ellis	Jan. 23	3	178	59
Middletown	Willard Clark	Jan. 19	3	150	50
Otisville	L. H. Mapes, Howells	Jan. 21	3	121	40
Pine Bush	B. F. Dickinson, Ulsterville	Jan. 22	3	203	68
Port Jervis	S. T. Braman, Chamber of Commerce, Port Jervis	Jan. 16	2	125	63
Unionville	Mrs. Mary B. Stoll	Jan. 20	3	332	111
ORLEANS:			18	1,473	82
Clarendon	Herbert Allis, Holley, R. D. 2.	Feb. 25	3	283	94
East Shelby	B. C. Roberts, Medina, R. D. 6	Feb. 24	3	198	66
Kendall	L. N. Wellman	Mar. 3	3	283	94
Lyndonville	C. H. I. Potter	Mar. 2	3	251	84
Murray	L. S. Walter, Holley	Mar. 4	3	180	60
West Shelby	Victor H. Harding, Middleport, R. D. 36	Feb. 23	3	278	93
OSWEGO:		1914	35	4,001	114
Amboy Center	Fred Jamieson, Williamstown, R. D. I	Dec. 1	3	202	67

REGULAR INSTITUTES — *Continued*

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
OSWEGO — *Concluded:*		1915			
Bernhards Bay	H. E. Myers	Jan. 26	3	328	109
Central Square	C. B. Allen, Central Square, R. D. 1	Jan. 27	3	450	150
Hannibal	P. A. Welling	Jan. 29-30	5	782	156
Lacona	A. R. Stevens	1914 Dec. 3	3	188	63
Mexico	D. D. Fennell, Jr., Mexico, R. D. 5	1915 Jan. 19	3	440	147
North Scriba	O. H. Cornwell, Oswego, R. D. 1	Jan. 20	3	222	74
Parish	M. L. Moran	Jan. 21	3	491	164
Pennellville	F. W. Morgan, Phoenix, R. D. 2	Jan. 28	3	300	100
Pulaski	Benj. H. Frary, Pulaski, R. D. 4	Jan. 18	3	397	132
Williamstown	E. N. Harris	1914 Dec. 2	3	201	67
OTSEGO:		1914	27	2,081	77
Cherry Valley	H. Cossart	Dec. 9	3	282	94
Edmeston	Chester Pope	Dec. 18	3	190	63
Fly Creek	S. H. Elderkin	Dec. 12	3	225	75
Morris	A. H. Tillson	Dec. 17	3	277	92
Mt. Vision	A. H. Straight, Mt. Vision, R. D. 2	Dec. 16	3	168	56
Otego	W. J. Birdsall	Dec. 21	3	180	60
Pierstown	Geo. T. Burnell, Cooperstown, R. D. 1	Dec. 10	3	205	68
Westville	Geo. Chamberlain, Schenevus, R. D.	Dec. 11	3	156	52
Worcester	Noah Vredenburg, Worcester, R. D. 3	Dec. 19	3	398	133
PUTNAM:		1915	9	636	71
Adams Corners	Geo. F. Barmore	Jan. 28	3	330	110
Mahopac	F. J. Ganong, Crafts	Jan. 29	3	119	40
Patterson	E. F. Hayt, Brewster	Feb. 2	3	187	62
RENSSELAER:		1914	21	1,649	79
Berlin	Arthur Cowee	Dec. 14	3	135	45
Eagle Mills	J. H. Potter	Dec. 17	3	215	72
Hoosick Falls	J. C. Cottrell	Dec. 15	3	191	64
Johnsonville	Wm. A. Gage	Dec. 16	3	296	99
Melrose	Chas. D. Hanaman	1915 Feb. 22	3	373	124
Raymertown	E. L. Button, Melrose	1914 Dec. 18	3	286	95
West Sand Lake	I. J. Cipperly	Dec. 22	3	153	51
ROCKLAND:		1915	5	336	67
Tallmans	Thos. T. Husson, Pomona	Jan. 25-26	5	336	67
ST. LAWRENCE:		1914	37	4,082	110
Brier Hill	B. B. Lane, Hammond	Dec. 16	2	225	113
Edwards	W. O. Kerr	Dec. 2	3	228	76
Fine	L. G. Harris	Dec. 1	3	399	133
Lawrenceville	J. P. Hourihan, No. Lawrence, R. D. 1	1915 Jan. 11	3	301	100
Lisbon	J. Leslie Craig	Jan. 13	2	419	210
Massena	W. V. Clemons	1914 Dec. 5	3	270	90
Nicholville	J. H. Smith	1915 Jan. 12	3	332	111
Norfolk	C. A. Whittaker, Norfolk, R. D. 1	Jan. 15	3	210	70

REGULAR INSTITUTES — *Continued*

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
ST. LAWRENCE—*Concl'd:*					
Potsdam	B. T. Scott, 31 Main St., Potsdam	Jan. 16	3	219	73
		1914			
Rensselaer Falls	H. B. Hammond	Dec. 4	3	365	122
Russell	L. B. Hatch, Hermon, R. D. 2	Dec. 3	3	258	86
		1915			
Waddington	Edward L. Fay, Waddington, R. D. 1	Jan. 14	3	402	134
		1914			
Winthrop	Geo. G. Gillett	Dec. 7	3	454	151
SARATOGA:			18	1,243	69
Clifton Park Ctr	J. F. Peck, Rexford	Dec. 21	3	133	44
		1915			
Galway	F. L. Smith, Ballston Spa., R. D. 1	Feb. 23	3	411	137
		1914			
Gansevoort	A. Heywood Cary, Gansevoort, R. D. 1	Dec. 2	3	194	65
Malta	William Olmsted, Mechanicsville, R. D. 3	Dec. 19	3	160	53
Wayville	Wm. R. Putnam	Dec. 1	3	189	63
Wilton	J. H. Westfall, Saratoga Springs, R. D. 2	Oct. 31	3	156	52
SCHENECTADY:		1914	9	406	45
Duanesburg	Bert Koons, Delanson, R. D. 2	Dec. 28	3	161	54
Glenville	Mina Van Epps, Hoffmans	Dec. 30	3	143	48
Pattersonville	I. F. Patterson	Dec. 29	3	102	34
SCHOHARIE:			17	711	42
Breakabeen	W. H. Travis, Middleburg, R. D. 1	Dec. 4	3	151	50
Broome Center	E. P. Cook, Gilboa, R. D	Dec. 3	2	160	80
Carlisle	Myron H. Brown, Sloansville	Dec. 7	3	81	27
Fultonham	Moses Lawyer	Dec. 5	3	67	22
Hyndsville	B. C. Holmes	Dec. 8	3	148	49
Manorkill	J. W. Van Steenburg	Dec. 15	3	104	35
SCHUYLER:		1915	17	1,470	86
Burdette	W. K. Mulligan	Mar. 12	3	281	94
Catherine	Mrs. M. H. Hewitt, Alpine	Mar. 13	3	221	74
Reading Center	Geo. W. McNemer	Mar. 11	3	317	106
Townsend	Geo. E. Raplee, Watkins, R. D. 3	Feb. 10	2	296	148
Valois	L. W. German	Mar. 11	3	145	48
		1914			
Wayne	D. E. Hoover, Keuka, R. D.	Nov. 19	3	210	70
SENECA:		1915	12	853	71
Covert	F. W. Lunger, Interlaken	Mar. 9	3	224	75
Ovid Grange, Scotts Corners	G. B. Akins, Ovid Center	Mar. 10	3	200	67
Romulus	C. W. Lisk	Mar. 8	3	156	52
Waterloo	H. H. Bonnell, Waterloo, R. D. 3	Mar. 6	3	273	91
STEUBEN:			39	3,304	85
Addison	L. J. Haynes	Mar. 3	3	159	53
Atlanta	C. G. Gray, No. Cohocton	Mar. 3	3	296	99
Bath	H. S. Emerson	Feb. 27	3	162	54
Caton	S. B. Hill, Corning, R. D. 2	Mar. 4	3	384	128
Greenwood	T. N. Blair	Feb. 24	3	377	126
Howard	Burt Bennett, Hornell, R. D. 4	Feb. 26	3	360	120
		1914			
Ingleside	C. E. Noble, Prattsburg, R. D. 3	Nov. 24	3	267	89

REGULAR INSTITUTES — *Continued*

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
STEUBEN — *Concluded:*					
North Urbana	E. F. Gleason, Hammondsport, R. D. 1	Nov. 20	3	213	71
Prattsburg	W. H. Babcock, Prattsburg, R. D. 5	Nov. 23	3	318	106
Rathbone	E. O. Hannahr, Cameron Mills	1915 Mar. 2	3	164	55
Savona	Isaac Johnson	1914 Nov. 21	3	71	24
Thurston	C. N. Risley, Campbells, R. D.	1915 Mar. 1	3	258	86
Stephens Mills	Smith Harding, Hornell, R. D. 2	Feb. 23	3	275	92
SUFFOLK:			20	1,426	71
Bridgehampton	Henry T. Haney	Jan. 12–13	5	304	61
East Northport	F. B. Smith, Ft. Salonga	Jan. 19	3	281	94
Orient	L. M. Young	Jan. 14	3	158	53
Port Jefferson	H. L. Terry, Terryville	Jan. 18	3	101	34
Sound Avenue	Jno. R. Reeve, 94 Sound Ave., Riverhead	Jan. 16	3	283	94
Southold	G. H. Smith, Peconic	Jan. 15	3	299	100
SULLIVAN:		1914	18	2,057	114
Bloomingburg	H. S. Riede, Bloomingburg, Box 114	Dec. 2	3	233	78
Grahamsville	Henry R. Groo	Dec. 4	3	534	178
Hurleyville	F. A. Durland	Dec. 3	3	204	68
Lake Huntington	H. J. Tyler, Cochecton Center	Nov. 30	3	310	103
Liberty	A. J. D. Wedemeyer	Dec. 5	3	231	77
Youngsville	Wm. Rittershausen	Dec. 1	3	545	182
TIOGA:		1915	17	1,675	99
Apalachin	C. F. Giles	Mar. 12–13	5	538	108
Barton Center	W. A. Wheeler, Waverly, R. D. 2	Mar. 15	3	297	99
Flemingville	Fred Miller, Owego, R. D. 3	Jan. 8	3	274	91
Nichols	S. M. Lounsbury, Owego	Mar. 11	3	190	63
Spencer	Geo. S. Robinson, Spencer, Box 28	Mar. 16	3	376	125
TOMPKINS:			21	928	44
Danby	T. G. Miller, Ithaca, R. D. 4	Mar. 17	3	106	35
East Lansing	D. C. DeCamp, Groton, R. D. 12	Feb. 27	3	196	65
Enfield Center	Fred D. Rumsey, Newfield, R. D. 28	Mar. 18	3	155	52
Freeville	M. L. Stanton	Mar. 18	3	117	39
Lansing	Chas. Moseley, Ludlowville	Mar. 1	3	160	53
Slaterville Springs	Dr. Wm. C. Gallagher	Mar. 15	3	85	28
Speedsville	F. E. Townsend, Berkshire	Jan. 7	3	109	36
ULSTER:			15	1,089	73
Gardiner	Joseph Deyo	Jan. 14	3	220	73
Lake Katrine	C. E. Davis, Saugerties, R. D. 4	Jan. 12	3	130	43
Plattekill	E. F. Soule, Jr., Gardiner, R. D. 2	Jan. 15	3	254	85
Stone Ridge	C. C. Hardenburg	Jan. 13	3	164	55
Woodstock	C. N. Riseley	Jan. 11	3	321	107
WARREN:		1914	10	604	60
Chestertown	J. B. Brown	Oct. 27	2	705	53
Glens Falls	W. J. Haviland	Dec. 12	3	140	47
Queensbury	G. A. Hubbell, Glens Falls, R. D. 1	Oct. 28	2	144	72
Wevertown	F. C. Hooper, No. River	Oct. 30	3	215	72
WASHINGTON:			12	2,114	66
Argyle	R. H. Stewart, Ft. Edward	Dec. 7	3	227	76
Cambridge	John C. Cottrell, Eagle Bridge	Dec. 10	3	278	93
Easton	J. F. Pratt, Greenwich, R. D. 1	Dec. 11	3	248	83

REGULAR INSTITUTES — *Continued*

COUNTY AND PLACE	LOCAL CORRESPONDENT	DATE	SESSIONS	ATTENDANCE	AVERAGE PER SESSION
WASHINGTON—*Concl'd:*					
Fort Ann	E. J. Needham, Hudson Falls, R. D. 7	Dec. 3	3	128	43
Fort Miller	Fred Hilton, Thomson	Nov. 30	3	228	76
Hartford	J. H. Beadle	Dec. 5	3	168	56
North Granville	Geo. S. Chapin, Smiths Basin, R. D. 2	Dec. 4	3	190	63
Putnam	Henry L. Roberts, Putnam Sta.	Dec. 22	2	73	37
Salem	W. S. Barker	Dec. 9	3	201	67
West Hebron	Wm. E. Getty, Granville, R. D. 2	Dec. 8	3	318	106
Whitehall	C. A. Johnson, Whitehall, Box 72	Dec. 23	3	55	18
WAYNE:		1915	23	1,636	71
Clyde	Chas. G. Roy	Feb. 18	3	248	83
Huron	Mrs. Gertrude C. Hatcher, Wolcott, R. D. 3	Feb. 3	3	180	60
Lincoln	J. C. Hulbert, Ontario	Mar. 15	3	321	107
Marion	C. H. Lookup, Box 84 Marion	Mar. 8	3	185	62
Red Creek	Geo. W. Brinkerhoff	Feb. 2	3	192	64
Savannah	Gipson Mead	Mar. 9–10	5	301	60
South Butler	W. E. Hall	Feb. 19	3	209	70
WESTCHESTER:			5	702	140
Cortlandt Grange, Peekskill	Miss Emma Tice, Peekskill	Jan. 27	3	152	51
Lincolndale	Rev. Bro. Barnabas	Jan. 30	2	550	275
WYOMING:		1915	21	2,062	98
Arcade	Geo. E. Hogue	Feb. 16	3	445	148
Bliss	E. J. Foote	Feb. 18	3	296	99
Castile	S. L. Strivings	Feb. 19	3	300	100
Cowlesville	Robt. J. Patch, Cowlesville, R. D. 1	Feb. 10	3	344	115
Curriers	Chas. F. Day, Java	Feb. 17	3	263	88
Varysburg	Lester L. Glor	Feb. 15	3	209	70
Warsaw	W. W. Smallwood	Feb. 20	3	205	68
YATES:			20	1,663	83
Benton	Russell Chapman, Penn Yan, R. D. 9	Feb. 8	3	199	66
Branchport	L. B. Fullager	Feb. 9	3	274	91
Lakemont	H. J. Roof, Dundee, R. F. 19	Feb. 11	3	238	79
Middlesex	F. E. Dunton	Feb. 22	3	398	133
Penn Yan	Chas. M. Watkins, Penn Yan, R. D. 9	Feb. 12–13	5	304	61
Rushville	C. E. James, Stanley, R. D. 5	Feb. 23	3	250	83
Total			1,167	95,446	82

STATE-WIDE COOPERATIVE MEETINGS

New York State Agricultural Society.

New York State Association of Beekeepers' Societies

New York State Breeders' Association.

New York State Dairymen's Association.

New York State Fruit Growers' Association.

New York State Vegetable Grower's Association.

State School of Agriculture, Canton, Farmers' Week.

State School of Agriculture, Alfred, Farmers' Week.

State School of Agriculture, Morrisville, Farmers' week.

Western New York Horticultural Society.

NUMBER OF DAYS' INSTITUTE WORK IN EACH COUNTY

COUNTY	DAYS	COUNTY	DAYS
Regular Institutes		*Regular Institutes*	
Albany	6	Oswego	12
Allegany	8	Otsego	9
Broome	6	Putnam	3
Cattaraugus	9		
Cayuga	9	Rensselaer	7
		Rockland	2
Chautauqua	14	St. Lawrence	13
Chemung	5	Saratoga	6
Chenango	7	Schenectady	3
Clinton	6		
Columbia	7	Schoharie	6
		Schuyler	6
Cortland	9	Seneca	4
Delaware	8	Steuben	13
Dutchess	10	Suffolk	7
Erie	9		
Essex	6	Sullivan	6
		Tioga	6
Franklin	7	Tompkins	7
Genesee	9	Ulster	5
Greene	5	Warren	4
Herkimer	7		
Jefferson	12	Washington	11
		Wayne	8
Lewis	5	Westchester	2
Livingston	6	Wyoming	7
Madison	14	Yates	7
Monroe	11		
Montgomery	5	Total	402
Nassau	2	*Round-up Institutes*	
Niagara	8	Livingston	3
Oneida	6	Orleans	3
Onondaga	11	Oswego	3
Ontario	8	Saratoga	3
		Wayne	3
Orange	7		
Orleans	6	Total	15

RECAPITULATION FOR REGULAR INSTITUTES, FARMERS' DAYS, AND MISCELLANEOUS MEETINGS, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE

	NO. OF MEETINGS	SESSIONS	TOTAL ATTENDANCE	AVERAGE PER SESSION
Regular Institutes	380	1,167	95,446	82
Farmers' days	5	40	6,062	152
Miscellaneous meetings	70	98	9,798	100
	455	1,305	111,306	85

TABLE SHOWING RECORD OF SPECIAL WOMEN'S SESSIONS, AND REGULAR INSTITUTE SESSIONS AND SPECIAL MEETINGS ADDRESSED BY WOMEN INSTITUTE WORKERS, JUNE 15, 1915, TO JUNE 14, 1915, INCLUSIVE.

COUNTY AND PLACE OF MEETING	Date	SPECIAL WOMEN'S SESSIONS		REGULAR INSTITUTE SESSIONS, MIXED AUDIENCES		SPECIAL MEETINGS	
		No. of sessions	Total attendance	No. of sessions	Total attendance	No. of sessions	Total attendance
ALBANY:		4	105	6	530	....	....
Coeymans Hollow	Jan. 7, 1915	1	26	1	63	....	....
Delmar	Jan. 6, 1915	1	35	1	110	....	....
Guilderland Center	Jan. 5, 1915	1	21	1	76	....	....
Medusa	Dec. 1, 1914	....	......	1	136	....	....
Rensselaerville	Dec. 2, 1914	....	......	1	75	....	....
Voorheesville	Jan. 4, 1915	1	23	1	70	....	....
Guilderland Center	Jan. 25, 1915	....	......	....	......	1	28
ALLEGANY:		8	394	8	948	....	....
Almond	Feb. 23, 1915	1	57	1	83	....	....
Angelica	Feb. 19, 1915	1	49	1	70	....	....
Bolivar	Feb. 16, 1915	1	20	1	50	....	....
Canaseraga	Feb. 20, 1915	1	43	1	98	....	....
Caneadea	Feb. 15, 1915	1	45	1	158	....	....
Friendship	Feb. 18, 1915	1	59	1	81	....	....
Scio	Feb. 18, 1915	1	67	1	168	....	....
Whitesville	Feb. 25, 1915	1	54	1	240	....	....
Alfred	Mar. 9–10, 1915	....	......	....	......	2	310
BROOME:		4	75	5	272	....	....
Deposit	Jan. 4, 1915	1	4	1	8	....	....
Harpursville	Dec. 23, 1914	1	27	....	......	....	....
Lisle	Feb. 4, 1915	....	......	1	69	....	....
North Colesville	Jan. 6, 1915	....	......	1	86	....	....
Vestal	Jan. 9, 1915	1	20	1	41	....	....
Windsor	Jan. 5, 1915	1	24	1	68	....	....
CATTARAUGUS:		7	349	7	830	....	....
Ashford Hollow	Feb. 5, 1915	1	30	....	......	....	....
Cattaraugus	Feb. 3, 1915	1	52	1	104	....	....
Conewango	Jan. 28, 1915	....	......	1	90	....	....
Cottage	Feb. 1–2, 1915	1	50	1	130	....	....
Delevan	Feb. 11, 1915	1	59	1	130	....	....
Elkdale	Feb. 4, 1915	1	45	1	125	....	....
Hinsdale	Feb. 13, 1915	1	56	1	115	....	....
Ischua	Feb. 12, 1915	1	57	1	136	....	....
CAYUGA:		9	387	9	797	....	....
Conquest	Feb. 20, 1915	1	70	1	113	....	....
East Venice	Mar. 3, 1915	1	21	1	65	....	....
Fair Haven	Feb. 1, 1915	1	46	1	107	....	....
Five Corners	Mar. 2, 1915	1	47	1	89	....	....
Locke	Mar. 16, 1915	1	46	1	120	....	....
Moravia	Mar. 17, 1915	1	46	1	90	....	....
Port Byron	Feb. 24, 1915	1	21	1	28	....	....
Scipioville	Mar. 18, 1915	1	42	1	113	....	....
Sennett	Feb. 26, 1915	1	48	1	72	....	....
CHAUTAUQUA:		11	541	8	974	....	....
Arkwright	Jan. 18, 1915	1	16	1	74	....	....
Cassadaga	Jan. 19, 1915	1	40	1	195	....	....
Charlotte Center	Jan. 20–21, 1915	1	50	1	76	....	....
Cherry Creek	Jan. 29–30, 1915	1	72	1	52	....	....
Forestville	Jan. 13–14, 1915	1	40	1	255	....	....
Gerry	Jan. 22, 1915	1	52	1	65	....	....
Jamestown	Jan. 23, 1915	1	24	1	32	....	....
Mayville	Jan. 26, 1915	1	65	....	......	....	....
Niobe	Jan. 25, 1915	1	60	....	......	....	....
Ripley	Jan. 15–16, 1915	1	70	1	225	....	....
Stedman	Jan. 27, 1915	1	52	....	......	....	....

TABLE SHOWING RECORD OF SPECIAL WOMEN'S SESSIONS, AND REGULAR INSTITUTE SESSIONS AND SPECIAL MEETINGS ADDRESSED BY WOMEN INSTITUTE WORKERS, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE — *Continued.*

COUNTY AND PLACE OF MEETING	Date	SPECIAL WOMEN'S SESSIONS		REGULAR INSTITUTE SESSIONS, MIXED AUDIENCES		SPECIAL MEETINGS	
		No. of sessions	Total attendance	No. of sessions	Total attendance	No. of sessions	Total attendance
Chemung:		5	202	5	336	....	....
Chemung	Mar. 10, 1915	1	37	1	45	....	....
Erin	Mar. 8, 1915	1	71	1	110	....	....
Hicks	Mar. 9, 1915	1	46	1	95	....	....
Horseheads	Mar. 6, 1915	1	25	1	32	....	....
Veteran Grange	Mar. 5, 1915	1	23	1	54	....	....
Chenango:		6	221	6	411	....	....
Beaver Meadow	Jan. 12, 1915	1	21	1	78	....	....
Greene	Jan. 11, 1915	1	78	1	78	....	....
McDonough	Feb. 2, 1915	1	68	1	103	....	....
New Berlin	Dec. 19, 1914	1	36	1	97	....	....
Norwich	Dec. 14–15, 1914	1	10	1	33	....	....
West Bainbridge	Dec. 22, 1914	1	8	1	22	....	....
Clinton:		6	161	2	186	....	....
Altona	Dec. 11, 1914	1	35	....	......	....	....
Champlain	Dec. 12, 1914	1	17	....	......	....	....
Ellenburg Center	Dec. 10, 1914	1	42	....	......	....	....
Ellenburg Depot	Dec. 9, 1914	1	20	....	......	....	....
Morrisonville	Dec. 15, 1914	1	12	1	46	....	....
Saranac	Dec. 14, 1914	1	35	1	140	....	....
Columbia:		4	162	8	595	....	....
Claverack	Feb. 13, 1915	....	......	1	82	....	....
Copake	Feb. 17, 1915	1	60	1	101	....	....
East Chatham	Feb. 18, 1915	1	42	1	91	....	....
Livingston	Feb. 15, 1915	1	25	1	65	....	....
Mellenville	Feb. 16, 1915	....	......	1	58	....	....
New Lebanon	Feb. 19, 1915	1	35	1	85	....	....
Spencertown	Feb. 20, 1915	....	......	2	113	....	....
Cortland:		8	391	8	667	....	....
Cincinnatus	Feb. 1, 1915	1	100	1	120	......	....
Cortland	Jan. 30, 1915	1	34	1	26	....	....
Freetown Corners	Mar. 5, 1915	1	29	1	89	....	....
Homer	Mar. 4, 1915	1	41	1	87	....	....
Marathon	Feb. 5, 1915	1	72	1	125	....	....
North Harford	Mar. 6, 1915	1	31	1	63	....	....
Preble	Jan. 29 ,1915	....	......	1	75	....	....
Texas Valley	Feb. 5–6, 1915	1	53	....	......	....	....
Willett	Feb. 3, 1915	1	31	1	82	....	....
Scott	Mar. 15, 1915	....	......	....	......	1	33
Delaware:		7	231	7	598	....	....
Downsville	Dec. 8, 1914	1	23	1	75	....	....
East Meredith	Dec. 12, 1914	1	49	1	122	....	....
Franklin	Dec. 11, 1914	1	63	1	238	....	....
Halcottsville	Dec. 18, 1914	1	14	1	55	....	....
Hancock	Dec. 7, 1914	1	12	....	......	....	....
Sidney Center	Dec. 10, 1914	1	32	1	42	....	....
Stamford	Dec. 14, 1914	....	......	1	15	....	....
Walton	Dec. 9, 1914	1	38	1	51	....	....
Dutchess:		4	148	11	855	....	....
Clinton Corners	Feb. 8–9, 1915	....	......	2	164	....	....
Hyde Park	Feb. 10, 1915	1	15	1	65	....	....
Moores Mills	Feb. 4, 1915	....	......	1	77	....	....
Myers Corners	Feb. 6, 1915	1	37	1	68	....	....
Pawling	Feb. 1, 1915	....	......	1	17	....	....

TABLE SHOWING RECORD OF SPECIAL WOMEN'S SESSIONS, AND REGULAR INSTITUTE SESSIONS AND SPECIAL MEETINGS ADDRESSED BY WOMEN INSTITUTE WORKERS, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE — *Continued.*

COUNTY AND PLACE OF MEETING	Date	SPECIAL WOMEN'S SESSIONS		REGULAR INSTITUTE SESSIONS, MIXED AUDIENCES		SPECIAL MEETINGS	
		No. of sessions	Total attendance	No. of sessions	Total attendance	No. of sessions	Total attendance
Dutchess—*Concluded*:							
Pleasant Plains	Feb. 11, 1915	....	......	2	199	....	....
Union Vale	Feb. 3, 1915	....	......	1	75	....	....
Upper Red Hook	Feb. 12, 1915	1	53	1	110	....	....
Wiocopee	Feb. 5, 1915	1	43	1	80	....	....
Erie:		6	367	8	950	....	....
Alden	Feb. 11, 1915	1	75	1	100	....	....
Bowmansville	Jan. 9, 1915	....	......	1	140	....	....
Brant	Jan. 12, 1915	....	......	1	130	....	....
Chaffee	Feb. 10, 1915	1	42	1	75	....	....
Clarence	Mar. 12, 1915	....	......	....	......	2	63
Clarence Center	Jan. 8, 1915	1	80	....	......	....	....
Collins Center	Jan. 11, 1915	....	......	1	152	....	....
Collins Center	Mar. 13, 1915	....	......	....	......	2	90
Griffins Mills	Feb. 8, 1915	1	50	1	121	....	....
Hunters Creek	Feb. 9, 1915	1	40	1	67	....	....
Springville	Feb. 6, 1915	1	80	1	165	....	....
Essex:		3	86	6	583	....	....
Crown Point	Dec. 19, 1914	1	14	....	......	....	....
Jay	Dec. 16, 1914	1	40	1	175	....	....
Moriah	Dec. 21, 1914	....	......	1	49	....	....
Olmestedville	Oct. 29, 1914	....	......	2	162	....	....
Westport	Dec. 18, 1914	....	......	1	47	....	....
Willsboro	Dec. 17, 1914	1	32	1	150	....	....
Franklin:		5	120	6	513	....	....
Bombay	Jan. 5, 1915	1	26	1	65	....	....
Brushton	Jan. 6–7, 1915	1	27	1	85	....	....
Chateaugay	Dec. 8, 1914	1	12	1	77	....	....
Fort Covington	Jan. 4, 1915	1	27	1	120	....	....
Malone	Jan. 8–9, 1915	1	28	2	166	....	....
Genesee:		5	241	9	962	....	....
Alexander	Feb. 13, 1915	1	70	1	130	....	....
Bethany Center	Feb. 12, 1915	....	......	1	161	....	....
Corfu	Feb. 8, 1915	....	......	1	127	....	....
Darien	Feb. 9, 1915	....	......	1	110	....	....
Elba	Jan. 6, 1915	1	33	1	80	....	....
Fort Hill	Feb. 25, 1915	1	53	1	143	....	....
Oakfield	Jan. 7, 1915	1	15	1	68	....	....
Pavilion Center	Feb. 24, 1915	1	70	1	54	....	....
South Byron	Jan. 5, 1915	....	......	1	89	....	....
Greene:		3	122	5	476	....	....
Freehold	Nov. 30, 1914	....	......	1	93	....	....
Halcott Center	Dec. 17, 1914	1	26	1	108	....	....
Leeds	Jan. 9, 1915	1	48	1	120	....	....
Prattsville	Dec. 16, 1914	....	......	1	21	....	....
West Coxsackie	Jan. 8, 1915	1	48	1	134	....	....
West Coxsackie	Jan. 22, 1915	....	......	....	......	2	100
Herkimer:		3	76	8	509	....	....
Dolgeville	Mar. 8, 1915	....	......	1	30	....	....
Frankfort	Mar. 6, 1915	....	......	1	34	....	....
Jordanville	Mar. 4, 1915	1	36	1	74	....	....
Poland	Mar. 9, 1915	....	......	1	85	....	....
Russia	Mar. 10, 1915	1	24	1	51	....	....
Van Hornesville	Mar. 3, 1915	1	16	1	41	....	....
West Winfield	Mar. 5, 1915	....	......	2	194	....	....

TABLE SHOWING RECORD OF SPECIAL WOMEN'S SESSIONS, AND REGULAR INSTITUTE SESSIONS AND SPECIAL MEETINGS ADDRESSED BY WOMEN INSTITUTE WORKERS, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE — *Continued.*

COUNTY AND PLACE OF MEETING	Date	SPECIAL WOMEN'S SESSIONS		REGULAR INSTITUTE SESSIONS, MIXED AUDIENCES		SPECIAL MEETINGS	
		No. of sessions	Total attendance	No. of sessions	Total attendance	No. of sessions	Total attendance
JEFFERSON:		9	278	9	621	....	......
Adams Center	Dec. 3-4, 1914	....	......	1	160	....	....
Calcium	Dec. 9, 1914	1	30	1	60	....	......
Carthage	Dec. 19, 1914	1	10	1	50	....	....
Dexter	Dec. 12, 1914	1	42	1	70	....	....
Henderson	Dec. 7, 1914	....	......	1	49	....	....
Hounsfield	Dec. 8, 1914	1	32	1	57	....	....
La Fargeville	Dec. 11, 1914	1	48	....	......	....	....
Natural Bridge	Dec. 17, 1914	1	22	....	......	....	....
Philadelphia	Nov. 30, 1914	1	40	....	......	....	....
Plessis	Dec. 15, 1914	....	......	1	16	....	....
Point Peninsular	Feb. 12, 1915	....	......	....	......	1	35
St. Lawrence	Dec. 10, 1914	1	36	1	104	....	....
Theresa	Dec. 14, 1914	1	18	1	55	....	....
LEWIS:		3	92	4	230	....	....
Barnes Corners	Dec. 5, 1914	1	52	1	77	....	....
Greig	Nov. 23, 1914	1	31	1	57	....	....
Talcottville	Nov. 24, 1914	....	......	1	71	....	....
West Leyden	Nov. 21, 1914	1	9	1	25	....	....
LIVINGSTON:		5	187	5	418	....	....
Caledonia	Feb. 26-27, 1915	1	16	1	27	....	....
Conesus	Mar. 1, 1915	1	25	1	114	....	....
Greigsville	Feb. 22, 1915	1	28	1	73	....	....
Linwood	Feb. 23, 1915	1	56	1	138	....	....
Springwater	Mar. 2, 1915	1	62	1	66	....	....
MADISON:		13	558	12	975	....	....
Brookfield	Dec. 22-23, 1914	1	26	1	51	....	....
Canastota	Mar. 15-16, 1915	2	70	1	32	....	....
De Ruyter	Mar. 17-18, 1915	2	112	1	92	....	....
Earlville	Jan. 13, 1915	1	65	1	50	....	....
Erieville	Jan. 20, 1915	1	61	1	166	....	....
Fenner	Mar. 16, 1915	1	61	1	99	....	....
Hamilton	Jan. 14, 1915	1	30	1	20	....	....
Hubbardsville	Dec. 21, 1914	1	18	1	26	....	....
Madison	Jan. 18, 1915	1	7	1	68	....	....
Morrisville	Jan. 28-29, 1915	....	......	....	......	4	345
Nelson	Nov. 19, 1914	1	67	1	147	....	....
Stockbridge	Jan. 15-16, 1915	1	41	2	224	....	....
MONROE:		8	376	9	1,032	....	....
Brockport	Feb. 26-27, 1915	1	18	1	24	....	....
Churchville	Jan. 4, 1915	1	30	1	78	....	....
Fairport	Mar. 13, 1915	1	38	1	111	....	....
Gates Center	Mar. 10, 1915	1	48	1	114	....	....
Greece	Mar. 8, 1915	1	46	1	100	....	....
Pittsford	Mar. 12, 1915	1	49	1	68	....	....
Spencerport	Mar. 9, 1915	1	49	1	122	....	....
Webster	Mar. 5-6, 1915	1	98	1	308	....	....
West Henrietta	Mar. 11, 1915	....	......	1	107	....	....
MONTGOMERY:		2	50	7	444	....	....
Canajoharie (Seeber's Lane Grange)	Feb. 27, 1915	....	......	1	64	....	....
Freysbush	Mar. 1, 1915	....	......	2	180	....	....
Glen	Feb. 25, 1915	1	19	1	55	....	....
Minaville	Feb. 24, 1915	1	31	1	81	....	....
St. Johnsville	Mar. 2, 1915	....	......	2	64	....	....
NASSAU:		1	17	1	84	....	....
Mineola	Jan. 20-21, 1915	1	17	1	84	....	....

TABLE SHOWING RECORD OF SPECIAL WOMEN'S SESSIONS, AND REGULAR INSTITUTE SESSIONS AND SPECIAL MEETINGS ADDRESSED BY WOMEN INSTITUTE WORKERS, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE — *Continued.*

COUNTY AND PLACE OF MEETING	Date	SPECIAL WOMEN'S SESSIONS		REGULAR INSTITUTE SESSIONS, MIXED AUDIENCES		SPECIAL MEETINGS	
		No. of sessions	Total attendance	No. of sessions	Total attendance	No. of sessions	Total attendance
NIAGARA:		6	427	10	1,614	....	....
Barker	Mar. 1, 1915	1	70	1	140	....	....
Johnson's Creek	Feb. 19, 1915	....	......	2	462	....	....
Middleport	Feb. 20, 1915	1	34	1	66	....	....
Newfane	Feb. 18, 1915	1	58	1	55	....	....
Pekin	Feb. 16, 1915	....	......	2	448	....	....
Pendleton Center	Feb. 15, 1915	1	64	1	150	....	....
Ransomville	Feb. 17, 1915	1	68	1	125	....	....
Rapids	Feb. 22, 1915	1	133	1	168	....	....
ONEIDA:		6	171	6	387	....	....
Boonville	Nov. 20, 1914	1	3	1	28	....	....
Camden	Nov. 30, 1914	1	56	1	110	....	....
Knoxboro	Jan. 19, 1915	1	51	1	146	....	....
Marcy	Mar. 11, 1915	1	25	1	50	....	....
Rome	Mar. 13, 1915	1	14	1	18	....	....
Sauquoit	Mar. 12, 1915	1	22	1	35	....	....
ONONDAGA:		8	346	10	1,024	....	....
Baldwinsville	Jan. 22–23, 1915	1	65	1	98	....	....
Borodino	Jan. 26, 1915	1	33	1	110	....	....
Camillus	Jan. 25, 1915	1	17	1	48	....	....
Jordan	Feb. 25, 1915	1	29	1	65	....	....
La Fayette	Jan. 28, 1915	1	44	1	56	....	....
Lysander	Jan. 25, 1915	....	......	1	152	....	....
Manlius	Jan. 22–23, 1915	1	15	2	200	....	....
North Manlius	Jan. 21, 1915	1	57	1	150	....	....
South Onondaga	Jan. 27, 1915	1	86	1	145	....	....
ONTARIO:		8	341	8	798	....	....
Bristol Springs	Mar. 5, 1915	1	37	1	124	....	....
Farmington	Feb. 17, 1915	1	40	1	120	....	....
Manchester	Feb. 5, 1915	1	47	1	46	....	....
Naples	Mar. 4, 1915	1	42	1	38	....	....
Phelps	Feb. 4, 1915	1	28	1	60	....	....
Reed's Corners	Feb. 6, 1915	1	67	1	107	....	....
Victor	Feb. 16, 1915	1	44	1	225	....	....
West Bloomfield	Feb. 15, 1915	1	36	1	78	....	....
ORANGE:		2	45	8	651	....	....
Balmville	Jan. 18, 1915	1	28	1	51	....	....
Bullville	Jan. 23, 1915	....	......	1	58	....	....
Middletown	Jan. 19, 1915	1	17	1	52	....	....
Otisville	Jan. 21, 1915	....	......	1	75	....	....
Pine Bush	Jan. 22, 1915	....	......	1	88	....	....
Port Jervis	Jan. 16, 1915	....	......	1	75	....	....
Unionville	Jan. 20, 1915	....	......	2	252	....	....
ORLEANS:		5	183	6	468	....	....
Clarendon	Feb. 25, 1915	1	23	1	118	....	....
East Shelby	Feb. 24, 1915	1	30	1	75	....	....
Kendall	Mar. 3, 1915	1	46	1	68	....	....
Lyndonville	Mar. 2, 1915	....	......	1	51	....	....
Murray	Mar. 4, 1915	1	41	1	66	....	....
West Shelby	Feb. 23, 1915	1	43	1	90	....	....
OSWEGO:		11	564	11	1,275	....	....
Amboy Center	Dec. 1, 1914	1	27	1	62	....	....
Bernhards Bay	Jan. 26, 1915	1	55	1	110	....	....
Central Square	Jan. 27, 1915	1	60	1	151	....	....
Hannibal	Jan. 29–30, 1915	1	82	1	300	....	....
Lacona	Dec. 3, 1914	1	27	1	78	....	....
Mexico	Jan. 19, 1915	1	52	1	126	....	....

TABLE SHOWING RECORD OF SPECIAL WOMEN'S SESSIONS, AND REGULAR INSTITUTE SESSIONS AND SPECIAL MEETINGS ADDRESSED BY WOMEN INSTITUTE WORKERS, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE — *Continued.*

COUNTY AND PLACE OF MEETING	Date	SPECIAL WOMEN'S SESSIONS		REGULAR INSTITUTE SESSIONS, MIXED AUDIENCES		SPECIAL MEETINGS	
		No. of sessions	Total attendance	No. of sessions	Total attendance	No. of sessions	Total attendance
OSWEGO—*Concluded:*							
North Scriba	Jan. 20, 1915	1	44	1	52	....	....
Parish	Jan. 21, 1915	1	81	1	138	....	....
Pennellville	Jan. 28, 1915	1	60	1	54	....	....
Pulaski	Jan. 18, 1915	1	51	1	94	....	....
Williamstown	Dec. 2, 1914	1	25	1	110	....	....
OTSEGO:		1	57	11	940	....	....
Cherry Valley	Dec. 8-9, 1914	....	......	1	85	....	....
Edmeston	Dec. 18, 1914	....	......	1	84	....	....
Fly Creek	Dec. 12, 1914	....	......	2	200	....	....
Morris	Dec. 17, 1914	....	......	1	135	....	....
Mt. Vision	Dec. 16, 1914	....	......	2	139	....	....
Otego	Dec. 21, 1914	....	......	1	72	....	....
Pierstown	Dec. 10, 1914	....	......	2	155	....	....
Westville	Dec. 11, 1914	....	......	1	70	....	....
Worcester	Dec. 19, 1914	1	57	....	......	....	....
PUTNAM:		2	61	3	255	....	....
Adams Corners	Jan. 28, 1915	1	32	1	140	....	....
Mahopac	Jan. 29, 1915	....	......	1	40	....	....
Patterson	Feb. 2, 1915	1	29	1	75	....	....
RENSSELAER:		6	186	7	617	....	....
Berlin	Dec. 14, 1914	1	14	1	60	....	....
Eagle Mills	Dec. 17, 1914	1	15	1	81	....	....
Hoosick Falls	Dec. 15, 1914	1	18	1	47	....	....
Johnsonville	Dec. 16, 1914	1	36	1	127	....	....
Melrose	Feb. 22, 1915	1	63	1	129	....	....
Raymertown	Dec. 18, 1914	1	40	1	105	....	....
West Sand Lake	Dec. 22, 1914	....	......	1	68	....	....
ROCKLAND:		....	......	3	232	....	....
Tallmans	Jan. 25-26, 1915	....	......	3	232	....	....
ST. LAWRENCE:		7	380	7	1,045	....	....
Brier Hill	Dec. 16, 1914	....	......	1	130	....	....
Fine	Dec. 1, 1914	1	70	....	......	....	....
Lawrenceville	Jan. 11, 1915	1	60	1	137	....	....
Lisbon	Jan. 13, 1915	1	67	1	255	....	....
Nicholville	Jan. 12, 1915	1	52	1	163	....	....
Norfolk	Jan. 15, 1915	1	31	1	63	....	....
Potsdam	Jan. 16, 1915	1	75	1	70	....	....
Waddington	Jan. 14, 1915	1	25	1	227	....	....
SARATOGA:		5	184	7	575	....	....
Clifton Park Center	Dec. 21, 1914	1	12	1	55	....	....
Galway	Feb. 23, 1915	1	92	1	167	....	....
Gansevoort	Dec. 2, 1914	1	30	1	100	....	....
Malta	Dec. 19, 1914	1	20	1	38	....	....
Wayville	Dec. 1, 1914	1	30	1	87	....	....
Wilton	Oct. 31, 1914	....	......	2	128	....	....
SCHENECTADY:		2	39	4	282	....	....
Duanesburg	Dec. 28, 1914	....	......	2	150	....	....
Glenville	Dec. 30, 1914	1	34	1	81	....	....
Pattersonville	Dec. 29, 1914	1	5	1	51	....	....
SCHOHARIE:		....	......	11	612	....	....
Breakabeen	Dec. 4, 1914	....	......	2	147	....	....
Broome Center	Dec. 3, 1914	....	......	2	160	....	....
Carlisle	Dec. 7, 1914	....	......	2	68	....	....
Fultonham	Dec. 5, 1914	....	......	2	63	....	....

TABLE SHOWING RECORD OF SPECIAL WOMEN'S SESSIONS, AND REGULAR INSTITUTE SESSIONS AND SPECIAL MEETINGS ADDRESSED BY WOMEN INSTITUTE WORKERS, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE — *Continued.*

COUNTY AND PLACE OF MEETING	Date	SPECIAL WOMEN'S SESSIONS		REGULAR INSTITUTE SESSIONS, MIXED AUDIENCES		SPECIAL MEETINGS	
		No. of sessions	Total attendance	No. of sessions	Total attendance	No. of sessions	Total attendance
SCHOHARIE—*Concluded:*							
Hyndsville	Dec. 8, 1914	....	......	2	132	....	....
Manorkill	Dec. 15, 1914	....	......	1	42	....	....
SCHUYLER:		5	242	7	719	....	....
Burdett	Mar. 12, 1915	1	46	1	150	....	....
Catherine	Mar. 13, 1915	1	42	1	83	....	....
Reading Center	Mar. 11, 1915	1	50	1	155	....	....
Townsend	Feb. 10, 1915	1	81	1	111	....	....
Valois	Mar. 11, 1915	1	23	1	60	....	....
Wayne	Nov. 19, 1914	....	......	2	160	....	....
SENECA:		4	168	4	304	....	....
Covert	Mar. 9, 1915	1	33	1	101	....	....
Ovid Grange (Scott's Corners)	Mar. 10, 1915	1	38	1	68	....	....
Romulus	Mar. 8, 1915	1	28	1	50	....	....
Waterloo	Mar. 6, 1915	1	69	1	85	....	....
STEUBEN:		11	590	13	1,020	....	....
Addison	Mar. 3, 1915	1	25	1	42	....	....
Atlanta	Mar. 3, 1915	1	39	1	95	....	....
Caton	Mar. 4, 1915	1	58	1	101	....	....
Greenwood	Feb. 24, 1915	1	61	1	154	....	....
Howard	Feb. 26, 1915	1	51	1	96	....	....
Ingleside	Nov. 24, 1914	1	75	1	70	....	....
North Urbana	Nov. 20, 1914	1	40	1	65	....	....
Prattsburg	Nov. 23, 1914	1	115	1	80	....	....
Rathbone	Mar. 2, 1915	1	35	1	50	....	....
Savona	Nov. 21, 1914	....	......	2	56	....	....
Stephens Mills	Feb. 22, 1915	1	54	1	106	....	....
Thurston	Mar. 1, 1915	1	37	1	105	....	....
SUFFOLK:		4	147	5	402	....	....
Bridgehampton	Jan. 12–13, 1915	1	26	1	42	....	....
East Northport	Jan. 19, 1915	....	......	1	116	....	....
Orient	Jan. 14, 1915	1	25	1	78	....	....
Port Jefferson	Jan. 18, 1915	....	......	1	35	....	....
Sound Avenue	Jan. 16, 1915	1	60	1	131	....	....
Southold	Jan. 15, 1915	1	36	....	......	....	....
SULLIVAN:		6	372	6	913	....	....
Bloomingburg	Dec. 2, 1914	1	42	1	131	....	....
Grahamsville	Dec. 4, 1914	1	104	1	262	....	....
Hurleyville	Dec. 3, 1914	1	22	1	116	....	....
Lake Huntington	Nov. 30, 1914	1	41	1	122	....	....
Liberty	Dec. 5, 1914	1	59	1	66	....	....
Youngsville	Dec. 1, 1914	1	104	1	216	....	....
TIOGA:		5	283	5	469	....	....
Apalachin	Mar. 12–13, 1915	1	48	1	134	....	....
Barton Center	Mar. 15, 1915	1	38	1	78	....	....
Flemingville	Jan. 8, 1915	1	38	1	93	....	....
Nichols	Mar. 11, 1915	1	56	1	44	....	....
Spencer	Mar. 16, 1915	1	103	1	120	....	....
TOMPKINS:		6	152	7	313	....	....
Danby	Mar. 17, 1915	1	27	1	30	....	....
East Lansing	Feb. 27, 1915	1	37	1	57	....	....
Enfield Center	Mar. 18, 1915	1	18	1	53	....	....
Freeville	Mar. 18, 1915	1	24	1	38	....	....
Lansing	Mar. 1, 1915	1	32	1	48	....	....

TABLE SHOWING RECORD OF SPECIAL WOMEN'S SESSIONS, AND REGULAR INSTITUTE SESSIONS AND SPECIAL MEETINGS ADDRESSED BY WOMEN INSTITUTE WORKERS, JUNE 15, 1914, TO JUNE 14, 1915, INCLUSIVE — *Concluded.*

COUNTY AND PLACE OF MEETING	Date	SPECIAL WOMENS SESSIONS		REGULAR INSTITUTE SESSIONS, MIXED AUDIENCES		SPECIAL MEETINGS	
		No. of sessions	Total attendance	No. of sessions	Total attendance	No. of sessions	Total attendance
TOMPKINS—*Concluded:*							
Slaterville Springs	Mar. 15, 1915	....	......	1	36	....	....
Speedsville	Jan. 7, 1915	1	14	1	51	....	....
ULSTER:		2	100	7	525	....	....
Gardiner	Jan. 14, 1915	....	......	2	185	....	....
Lake Katrine	Jan. 12, 1915	....	......	2	93	....	....
Plattekill	Jan. 15, 1915	1	57	1	105	....	....
Stone Ridge	Jan. 13, 1915	....	......	2	142	....	....
Woodstock	Jan. 11, 1915	1	43	....	....	....	....
WARREN:		....	......	7	502	....	....
Chestertown	Oct. 27, 1914	....	......	2	105	....	....
Glens Falls	Dec. 12, 1914	....	......	1	70	....	....
Queensbury	Oct. 28, 1914	....	......	2	144	....	....
Wevertown	Oct. 30, 1914	....	......	2	183	....	....
WASHINGTON:		10	359	11	961	....	....
Argyle	Dec. 7, 1914	1	45	1	82	....	....
Cambridge	Dec. 10, 1914	1	44	1	75	....	....
Easton	Dec. 11, 1914	1	47	1	112	....	....
Fort Ann	Dec. 3, 1914	1	32	1	65	....	....
Fort Miller	Nov. 30, 1914	1	30	1	150	....	....
Hartford	Dec. 5, 1914	1	28	1	90	....	....
North Granville	Dec. 4, 1914	1	30	1	100	....	....
Putnam	Dec. 22, 1914	1	14	1	14	....	....
Salem	Dec. 9, 1914	1	33	1	85	....	....
West Hebron	Dec. 8, 1914	1	56	1	178	....	....
Whitehall	Dec. 23, 1914	....	......	1	10	....	....
WAYNE:		5	160	9	813	....	....
Clyde	Feb. 18, 1915	1	50	1	95	....	....
Huron	Feb. 3, 1915	1	27	1	51	....	....
Lincoln	Mar. 15, 1915	....	......	2	285	....	....
Marion	Mar. 8, 1915	....	......	1	78	....	....
Red Creek	Feb. 2, 1915	1	22	1	53	....	....
Savannah	Mar. 9–10, 1915	1	36	2	146	....	....
South Butler	Feb. 19, 1915	1	25	1	105	....	....
WESTCHESTER:		1	32	2	352	....	....
Lincolndale	Jan. 30, 1915	....	......	1	300	....	....
Peekskill (Cortlandt Grange)	Jan. 27, 1915	1	32	1	52	....	......
WYOMING:		5	255	7	851	....	....
Arcade	Feb. 16, 1915	1	50	1	220	....	....
Bliss	Feb. 18, 1915	1	50	1	124	....	....
Castile	Feb. 19, 1915	1	70	1	106	....	....
Cowlesville	Feb. 10, 1915	1	68	1	155	....	....
Curriers	Feb. 17, 1915	....	......	1	108	....	....
Varysburg	Feb. 15, 1915	....	......	1	90	....	....
Warsaw	Feb. 20, 1915	1	17	1	48	....	....
YATES:		6	262	6	497	....	....
Benton	Feb. 8, 1915	1	38	1	63	....	....
Branchport	Feb. 9, 1915	1	30	1	82	....	....
Lakemont	Feb. 11, 1915	1	37	1	65	....	....
Middlesex	Feb. 22, 1915	1	75	1	175	....	....
Penn Yan	Feb. 12–13, 1915	1	17	1	22	....	....
Rushville	Feb. 23, 1915	1	65	1	90	....	....
		288	12,043	387	35,212	15	1,004

RECAPITULATION OF WOMEN'S WORK

	Number	Attendance
Special women's sessions	288	12,043
Regular sessions, mixed audiences	387	35,212
Special meetings, sessions	15	1,004
Totals	690	48,259

LIST OF FARMERS' INSTITUTE WORKERS, JUNE 15, 1914 TO JUNE 14, 1915, INCLUSIVE

DIRECTOR OF FARMERS' INSTITUTES

Edward van Alstyne

In Charge of Meetings

J. G. Curtis, Rochester.
William Hotaling, Kinderhook.
Roy P. McPherson, LeRoy.
A. J. Nicoll, Delhi.
Robert P. Trask, North Wilbraham, Mass.
Jared Van Wagenen, Jr., Lawyersville.
C. R. White, Ionia.
D. P. Witter, Berkshire.

REGULAR LECTURERS WITH DATES OF SERVICE

Bennett, E. R., Ithaca	Dec. 4, 16, 19; Jan. 4–9, 21, 29; Feb. 10–11, 15–20, 26–27; Mar. 6–10, 17–18.
Bonsteel, F. E., Ashville	Nov. 19–24, 30; Dec. 1–5; Jan. 4–11; Feb. 15–27; Mar. 1–18.
Brodhead, Dr. C. W., Montrose, Pa.	Mar. 1–18.
Curtis, J. G., Rochester	Nov. 30; Dec. 1–22; Jan. 4–29; Feb. 2–27; Mar. 1–18.
Dexter, Dr. Wm. Hart, Washington, D. C	Nov. 30; Dec. 1–23; Jan. 5–30; Feb. 1–27; Mar. 1–18.
Hamilton, Dr. M., Delhi	Oct. 27–31; Nov. 30; Dec. 1–22; Jan. 4–30; Feb. 1–27; Mar. 1–18.
Harrington, Mrs. Ida S., Albany	Nov. 19–24, 30; Dec. 1–12; Jan. 4–30; Feb. 1–27; Mar. 1–18, 24.
Heaton, Dr. Lucia E., Canton	Nov. 30; Dec. 1–12; Jan. 13–29; Feb. 1–26.
Hotaling, William, Kinderhook	Sept. 25; Oct. 8, 27–31; Nov. 7, 30; Dec. 1–22, 28–30; Jan. 4–30; Feb. 1–25; Mar. 1–18.
Jones, Mrs. D. A., Worcester	Nov. 30; Dec. 1–23; Jan. 4–29; Feb. 1–26; Mar. 1–18.
Jones, Miss Jennie C., Paris	Dec. 14–23; Jan. 18–28; Mar. 9–11.
McPherson, Roy P., LeRoy	Nov. 19–24; Dec. 7–22; Jan. 4–6, 9–30; Feb. 1–27; Mar. 1–18.
Monroe, Mrs. Mary T., Dryden	Oct. 27–31; Nov. 19–24, 30; Dec. 1–22, 28–30; Jan. 12–30; Feb. 1–27; Mar. 1–18, 24–25.
Montgomery, Miss Etta E., Silver Creek	Dec. 5, 14–22; Feb. 1–5; Mar. 1–18.
Nicoll, A. J., Delhi	Nov. 19–24, 30; Dec. 1–23, 29–31; Jan. 4–30; Feb. 1–26; Mar. 1–18, 24.

Phelps, Mrs. Orra P., Canton	Dec. 8–22; Jan. 4–13; Feb. 12–27; Mar. 1–15.
Santee, Dr. E. M., Cortland	Nov. 30; Dec. 1–23; Jan. 4–30; Feb. 1–27; Mar. 1–18.
Trask, Robert P., North Wilbraham, Mass	Nov. 30; Dec. 1–23; Jan. 4–29.
Van Wagenan Jared, Jr., Lawyersville	Nov. 19, 30; Dec. 1-23, 28–30; Jan. 8, 12–21, 29; Feb. 1–6, 25; Mar. 5–11, 16–17, 23.
White, C. R., Ionia	Nov. 20–24, 30; Dec. 1–23; Jan. 14–18, 22–30; Feb. 1–9, 12–27; Mar. 1–18.
Witter, D. P., Berkshire	Nov. 30; Dec. 1–22; Jan. 4–30; Feb. 1–27; Mar. 1–18.

LECTURERS FROM STATE DEPARTMENT OF AGRICULTURE

Dr. J. F. DeVine, Consulting Veterinarian, Goshen, N. Y.
C. C. Mitchell, Bureau of Cooperation, Albany, N. Y.
L. F. Strickland, Nursery Inspector, Lockport, N. Y.

LECTURERS FROM STATE COLLEGE OF AGRICULTURE

M. F. Barrus, Extension Professor of Plant Pathology, Ithaca, N. Y.
Geo. W. Cavanaugh, Professor of Chemistry, Ithaca, N. Y.
L. J. Cross, Professor of Chemistry, Ithaca, N. Y.
R. W. Curtis, Professor of Landscape Art, Ithaca, N. Y.
E. O. Fippin, Extension Professor of Soil Technology, Ithaca, N. Y.
Miss Helen Knowlton, Instructor in Home Economics, Ithaca, N. Y.
R. S. Moseley, Assistant, Poultry Department, Ithaca, N. Y.
V. B. Stewart, Assistant Professor of Plant Pathology, Ithaca, N. Y.
A. E. Wilkinson, Extension Instructor, Ithaca, N. Y.
H. H. Wing, Professor of Animal Husbandry, Ithaca, N. Y.

LECTURERS FROM NEW YORK AGRICULTURAL EXPERIMENT STATION

R. D. Anthony, Associate Horticulturist, Geneva, N. Y.
F. E. Gladwin, Associate Horticulturist, Fredonia, N. Y.
F. Z. Hartzell, Associate Entomologist, Fredonia, N. Y.
U. P. Hedrick, Horticulturist, Geneva, N. Y.
P. J. Parrott, Entomologist, Geneva, N. Y.
Geo. A. Smith, Dairy Expert, Geneva, N. Y.
F. C. Stewart, Botanist, Geneva, N. Y.
O. M. Taylor, Foreman in Horticulture, Geneva, N. Y.

LECTURERS FROM STATE COLLEGE OF FORESTRY

C. W. Allen, Syracuse, N. Y.
Hugh P. Baker, Dean, Syracuse, N. Y.
J. W. Stephen, Assistant Professor of Silviculture, Syracuse, N. Y.

LECTURERS FROM STATE SCHOOLS OF AGRICULTURE

J. F. Eastman, Morrisville, N. Y.
A. B. Graham, Farmingdale, N. Y.
F. G. Helyar, Morrisville, N. Y.
Van E. Leavitt, Morrisville, N. Y.
John Michels, Farmingdale, N. Y.
W. B. Nissley, Farmingdale, N. Y.

LECTURERS FROM STATE EDUCATION DEPARTMENT

Dr. Arthur D. Dean, Chief of Vocational Schools, Albany, N. Y.
Dr. E. P. Felt, State Entomologist, Albany, N. Y.
Dr. Thos. E. Finegan, Assistant Commissioner of Education, Albany, N. Y.

LECTURERS FROM STATE CONSERVATION COMMISSION

Geo. L. Barrus, Director of Forest Investigations, Albany, N. Y.

LECTURERS FROM NEW JERSEY AGRICULTURAL EXPERIMENT STATION

Alva Agee, Chief of Agricultural Extension Work, New Brunswick, N. J.
H. R. Lewis, Poultry Husbandman, New Brunswick, N. J.
F. C. Minckler, Professor of Animal Husbandry, New Brunswick, N. J.

SPECIAL LECTURERS

E. S. Akin, Glens Falls, N. Y.
M. C. Burritt, Ithaca, N. Y.
Nathan Cohen, New York City.
H. W. Collingwood, New York City.
H. E. Cox, Geneseo, N. Y.
F. E. Dawley, Fayetteville, N. Y.
Hon. John J. Dillon, New York City.
John A. Ennis, Pattersonville, N. Y.
H. A. Harpending, Dundee, N. Y.
Geo. W. Harris, Baldwinsville, N. Y.
Dean J. L. Hills, Burlington, Vt.
John Jeannin, Jr., West Sand Lake, N. Y.
A. B. Katkamier, Macedon, N. Y.
Marion Lewis, Cameron Mills, N. Y.
T. E. Martin, West Rush, N. Y.
Miss Katherine Mills, Buffalo, N. Y.
Mrs. Rose Morgan, New York City.
Dr. J. C. Mulvey, Mooers, N. Y.
J. W. Pincus, New York City.
I. F. Rice, Cortland, N. Y.
J. W. Sanborn, Pittsfield, N. H.
H. G. Sibbald, Claud, Ontario, Canada.
F. A. Sirrene, Riverhead, N. Y.
Ezra A. Tuttle, New York City.
Dean R. L. Watts, State College, Pa.
L. A. Webster, Whiting, Vt.
Joseph E. Wing, Mechanicsburg, Ohio
Dr. E. L. Volgenau, Buffalo, N. Y.

FARMERS' DAYS

As the table below shows, with the exception of Albion and Schuylerville, the Farmers' Days' meetings did not receive the numerical support which the character of the program and the necessary expense involved in the holding of such meetings would seem to warrant. Unless the Director shall have positive assurance of attendance and interest commensurate with the effort, no attempt will be made to conduct meetings of this character in the future.

County and place	Correspondent	Date		Session	Attend.	Average per session
Livingston:			1915			
Dansville	J. M. Foster	Mar.	9-10-11	8	1,268	159
Orleans:						
Albion	John Bidelman	Mar.	15-16-17	8	2,291	286
Oswego:			1914			
Oswego	F. H. Tullar	Dec.	7-8-9	8	428	54
Saratoga:			1915			
Schuylerville	A. C. Lottridge	Mar.	23-24-25	8	1,474	184
Wayne:						
Lyons	D. V. Teller	Mar.	16-17-18	8	601	75
Totals				40	6,062	152

As always, Albion, in Orleans county, was the banner large meeting of the year. Program with detailed report of addresses and discussions at the Albion meeting are given in Part II of this report.

SPECIAL LECTURES

Owing to lack of funds thirty less special lectures were given than in 1912–13. It was with much regret that request after request for these special lectures had to be refused. Two places where a series of special lectures were held are worthy of special mention, namely, at Rome and at Perryville. The lectures at Rome were given under the direction of Mr. W. G. Searles, Secretary of the Chamber of Commerce. A series of nine lectures were held, one each week, Cornell University supplying a portion of the lecturers. Dates, subjects, etc., are shown under special lectures, page 2188, Oneida county.

Perryville, Madison county, had a series of four lectures, under the auspices of Rev. Feder C. Ether, pastor of one of the local churches. In this case the lecturer spoke both in the afternoon and evening. Speakers, subjects, etc., are shown in abovementioned table under Madison county.

Two lectures on general farming were delivered by Mr. Jared Van Wagenen, Jr., at the East Side Y. M. C. A., New York City.

LECTURES FOR JEWISH FARMERS

For the two previous years, as noted in the reports, special meetings have been held among the Jewish farmers, of whom there are an increasing number in our state. Such are in particular need of help. For nearly two thousand years they have had little to do with land, and the inherent love of the soil so prominent in the minds of most other races is largely lacking among the Hebrews. They must be both inspired and instructed.

Cooperating with Mr. J. W. Pincus, Secretary of the Federation of Jewish Farmers of America, who selected the places and made arrangements for the meetings, Mr. F. E. Bonsteel held eight meetings in Sullivan and Ulster counties, where there is a large Jewish settlement. Mr. Bonsteel was assisted by Mr. Nathan Cohen, who in many cases acted as an interpreter. Mr. John A. Ennis held a similar meeting at Manlius, Onondaga county. Mr. William Hotaling and Mr. Cohen also visited a Jewish settlement near Sand Lake, Rensselaer county, where the former gave practical demonstrations in horticulture. Of necessity, the instruction given to these people must be inspiring and simple, and withal must cover a wide field. From the reports received this work was especially appreciated and unquestionably productive of much good.

MISCELLANEOUS MEETINGS TO WHICH DEPARTMENT SPEAKERS WERE SENT

COUNTY AND PLACE	DATE	SESSIONS	ATTENDANCE	SPEAKER	SUBJECT
ALBANY:					
Albany	Dec. 7, 1914	1	28	Wm. Hotaling	Poultry.
Guilderland Center	Jan. 25, 1915	1	28	Mrs. I. S. Harrington	Home topics.
Rensselaerville	May 28, 1915	1	65	Edward van Alstyne	The farmer and the church.
South Bethlehem	May 7, 1915	1	36	Edward van Alstyne	Arbor Day.
ALLEGANY:					
Beech Hill Pavilion	May 28, 1915	1	300	F. E. Bonsteel	Club work, school law.
BROOME:					
Binghamton	Feb. 25–27, 1915	3	280	C. R. White	Fertility, potatoes, fruits and vegetables
CHAUTAUQUA:					
Brocton	Dec. 19, 1914	1	50	E. R. Bennett	Fruit.
CHENANGO:					
Afton	May 7, 1915	1	325	Jared Van Wagenen, jr	Arbor Day
CLINTON:					
Plattsburg	June 17, 1914	1	600	Mrs. Rose Morgan	Music.
COLUMBIA:					
New Lebanon	May 26, 1915	1	22	Jared Van Wagenen, jr	Dairying and feeding

CORTLAND:					
Hunts Corners	Mar. 16, 1915	1	18	Mrs. I. S. Harrington	Home topics.
Scott	Mar. 15, 1915	1	33	Mrs. I. S. Harrington	Home topics.
DUTCHESS:					
Lake Hammersley	May 28, 1915	1	50	Valancy E. Fuller	Feeding.
ERIE:					
Clarence Center	Mar. 12, 1915	2	63	Mrs. I. S. Harrington	Home topics.
Collins Center	Mar. 13, 1915	2	90	Mrs. I. S. Harrington	Home topics.
GREENE:					
Coxsackie	Nov. 7, 1914	1	46	Wm. Hotaling	Fruit, apple packing law.
East Jewett	Feb. 1–2, 1915	2	70	John A. Ennis	Dairying.
Freehold	Sept. 25, 1914	1	86	Wm. Hotaling	Apple packing law.
Hensonville	Feb. 4, 1915	1	28	John A. Ennis	Dairying.
West Coxsackie	Jan. 22–23, 1915	2	100	Mrs. I. S. Harrington	Home topics.
West Coxsackie	May 24–26, 1915	6	371	Mrs. I. S. Harrington	Home topics.
Windham	Feb. 5, 1915	1	32	John A. Ennis	Dairying.
JEFFERSON:					
Point Peninsular	Feb. 12, 1915	1	35	Mrs. O. P. Phelps	Home topics.
Watertown	April 14, 1915	1	10	A. J. Nicoll	Cow testing.
KINGS:					
Brooklyn	May 7, 1915	2	2,500	W. B. Nissley	Arbor Day.
MADISON:					
Perryville	Jan. 29, 1915	2	68	E. R. Bennett	Farm crops.
Perryville	Feb. 2, 1915	2	58	Jared Van Wagenen, jr	Dairying.
Perryville	Feb. 24, 1915	2	19	I. F. Rice	Poultry.
Perryville	Mar. 18, 1915	2	57	Dr. Wm. H. Dexter	Farm management, country church.

MISCELLANEOUS MEETINGS TO WHICH DEPARTMENT SPEAKERS WERE SENT — (*Continued*)

COUNTY AND PLACE	DATE	SESSIONS	ATTENDANCE	SPEAKER	SUBJECT
NEW YORK:					
New York (East Side Branch Y. M. C. A.)	Mar. 6, 1915	1	80	Jared Van Wagenen, jr	General farming.
New York (East Side Branch Y. M. C. A.)	Apr. 22, 1915	1	65	Jared Van Wagenen, jr	General farming.
NIAGARA:					
Middleport	Dec. 5, 1914	1	125	Miss E. E. Montgomery	Home topics.
ONEIDA:					
Rome	Jan. 9, 1915	1	160	Robt. P. Trask	Poultry.
Rome	Jan. 16, 1915	1	150	H. B. Harpending	Swine.
Rome	Jan. 23, 1915	1	50	H. H. Wing	Milk production.
Rome	Jan. 30, 1915	1	45	Jared Van Wagenen, jr	Soils.
Rome	Feb. 6, 1915	1	14	R. W. Curtis	Shade trees.
Rome	Feb. 13, 1915	1	56	Wm. Hotaling	Orchards.
Rome	Feb. 20, 1915	1	60	A. E. Wilkinson	Market gardening.
Utica	Dec. 4, 1914	1	28	E. R. Bennett	Fruit.
Utica	Jan. 25, 1915	1	100	A. J. Nicoll	Cow testing.
ONONDAGA:					
Manlius	Feb. 8, 1915	1	27	John A. Ennis	General agriculture.
Syracuse	Jan. 11, 1915	1	67	F. E. Bonsteel	Potatoes.
Syracuse	Jan. 16, 1915	2	140	L. A. Webster	Sheep.
Syracuse	Feb. 1, 1915	2	49	Jared Van Wagenen, jr	Dairying.
ORANGE:					
Port Jervis	Oct. 8, 1914	1	72	Wm. Hotaling	Poultry.

OSWEGO:					
Fulton	Dec. 15–16, 1914	3	380	Marion Lewis	Poultry, horses.
				E. R. Bennett	Fruit, vegetables.
				T. E. Martin	Drainage
Williamstown	Oct. 30, 1914	3	725	A. B. Katkamier	Potatoes, Nature study, cooperation.
OTSEGO:					
Elk Creek	Dec. 30, 1914	1	15	A. J. Nicoll	Dairying.
Hartwick	Jan. 14–15, 1915	2	70	L. A. Webster	Sheep.
Hartwick	Mar. 2, 1915	1	37	F. E. Dawley	Sheep
Schenevus	Dec. 31, 1914	1	22	A. J. Nicoll	Dairying.
Westford	Dec. 29, 1914	1	40	A. J. Nicoll	Dairying.
Worcester	Aug. 21, 1914	1	200	John Jeannin, jr	Better flowers, fruits and vegetables and how to grow them.
RENSSELAER:					
East Greenbush	Feb. 3, 1915	1	83	Jared Van Wagenen, jr	Corn.
Troy	April 19, 1915	1	400	John Jeannin, jr.	Gardening.
ROCKLAND:					
Stony Point	May 7, 1915	2	183	Wm. Hotaling	Arbor Day; combating insects (followed by demonstration); control insects on shade trees.
SARATOGA:					
Charlton	Feb. 4, 1915	1	84	Jared Van Wagenen, jr	General agriculture.
SULLIVAN:					
Narrowsburg	Jan. 23, 1915	2	104	Robt. P. Trask	Poultry.
Centerville Station	Jan. 7, 1915	2	116	F. E. Bonsteel	Crop rotation.
				Nathan Cohen	Lime.
Fallsburg	Jan. 6, 1915	1	23	F. E. Bonsteel	Crop rotation.
				Nathan Cohen	Lime, early crops.

MISCELLANEOUS MEETINGS TO WHICH DEPARTMENT SPEAKERS WERE SENT — (*Concluded*)

COUNTY AND PLACE	DATE	SESSIONS	ATTENDANCE	SPEAKER	SUBJECT
Ferndale	Jan. 5, 1915	1	13	F. E. Bonsteel Nathan Cohen	Crop rotation. Insects and diseases.
Monticello	Jan. 4, 1915	1	9	F. E. Bonsteel Nathan Cohen	Crop rotation. Lime.
Parksville	Jan. 4, 1915	1	27	F. E. Bonsteel Nathan Cohen	Crop rotation. Seed testing.
ULSTER:					
Ellenville	Jan. 8, 1915	1	32	F. E. Bonsteel Nathan Cohen	Crop rotation, dairying. Insects and diseases of fruit trees.
Greenfield	Jan. 9, 1915	1	54	F. E. Bonsteel Nathan Cohen	Crop rotation, dairying. Lime.
Wallkill	Feb. 6, 1915	1	83	Jared Van Wagenen, jr	Dairying.
WASHINGTON:					
Granville	Oct. 28, 1914	1	75	Jared Van Wagenen, jr	Corn.
WYOMING:					
Attica	Feb. 25, 1915	1	63	Jared Van Wagenen, jr	Breeding.
YATES:					
Bellona	Jan. 22, 1915	3	204	I. F. Rice	Poultry.
Totals		98	9,798		

COOPERATIVE WORK WITH COLUMBIA UNIVERSITY, NEW YORK CITY

No work of the bureau had such enthusiastic support as that carried on with Professor O. S. Morgan, head of the Agricultural Department of Columbia University. Beginning January 15, 1915, and continuing to April 23, 1915, every Friday, there was present at Professor Morgan's office either a representative of the Agricultural Department of Columbia University or of the Department of Agriculture at Albany, for the purpose of meeting those from the city or elsewhere who were interested in agriculture. The scope of the inquiries is indicated by the following from the report of Professor Morgan:

Information concerning state schools of agriculture, and winter courses, short courses, college courses, graduate and correspondence courses of state colleges of agriculture.

How to prepare for extension and county agent positions. How to prepare for farm superintendency, and milk inspector. How to get practice in actual farming of various sorts, especially truck, fruit, poultry, hog and dairy.

School gardening problems.

How much income to be expected from various amounts invested in farming of various types.

List of reliable agricultural books, bulletins, and periodicals.

Positions wanted on typically good farms — Many willing to work for board; others wanting managership.

Places for sale, rent or partnership.

Crop rotation and fertilizer plans for definite farms in various sections of the east.

Dairy farming on Atlantic Coast as compared with dairying in California.

Liming, phosphate carriers, substitutes for potash, radium "fertilizers," fertilizers for legumes and for a mixture of grasses and legumes.

The culture of alfalfa, soy bean, vetches, etc., in eastern farming.

Catch crops, cover crops, green manuring.

Orchard problems, including advice on culture of quince, pecan, walnut and fig.

Special information on fruit packages, and where to get training in fruit and vegetable packing.

Farm building, silo, dairy barns, farm machinery, especially gas engines and tractor.

Analyses of rock, shale, soil, muck, fertilizers, feeds, seeds and spring water.

How to control a balky horse. How to treat diseases of chickens, hogs and cattle. How to raise veal on skim milk. How to make butter.

Where to apply for family provision baskets of garden, poultry and dairy products.

Wood-lot problems.

Where to go to become a forester; a landscape architect.

How work up a farmers' credit loan scheme. How devise a scheme to eliminate unnecessary middlemen.

How establish a community of farmers on cooperative equal share basis.

How put into practice in farming the chain-store plan.

Request for information on a series of morally clean moving picture shows.

The question that most frequently occurred was that relating to necessary finances, experience for and the likely income from farming. The impression that one has ground into him, whether he wishes it or not, is that the city man's mind is still possessed of the false idea that a very considerable and peculiar novitiate is not necessary for him who would earn his bread and obtain interest on his investment by farming. Until the city man's mind is disabused of this conception there will be a proper and fertile field for the Institute in New York City.

All the publications of the Department of Agriculture were available for distribution at Professor Morgan's office.

At four o'clock on each afternoon a lecture was given as shown on the program following. The attendance indicates the appreciation to a degree only. To understand it to the full one must have been present and observed the intense interest and eager questioning. Nor was this the full extent of this work. It has resulted in a correspondence with the college, the Director of Institutes, and the several speakers, too far reaching to attempt to estimate.

For this work $500 has been expended for rent and janitor services, and $190.43 for lecture fees and expenses. At first glance this may appear too great as compared with the amount expended in the up-state counties, but when one considers that Greater New York pays a large percentage of the funds for this, as well as other state expenditures, the proportion does not seem unduly great. And there is no other line of work more productive of results, negative as well as positive.

PROGRAM AND ATTENDANCE AT LECTURES

Institute for City Dwelling Farmers

This course is offered without charge to all people in and about New York City who are interested in any phase of practical scientific farming. The university through its department of agriculture cooperates with the New York State Department of Agriculture in giving the lectures and in offering free consultation on farm problems. A representative will be in attendance in Room 511, Schermerhorn Hall, every Friday, beginning January 15, 1915.

Place of Lecture — 305 Schermerhorn Hall, Columbia University, New York City.

Time — 4:10–5:00 P. M., Friday.

1915	FRIDAY	Attendance
Jan. 15	— "The Outlook of the City Man to Farming," O. S. Morgan, Professor of Agriculture, Columbia University	110
Jan. 22	— "Essential Factors in Poultry Management," Robert P. Trask, Poultry Specialist, New York State Farmers' Institute	130
Jan. 29	— "Soil Composition and Crop Requirements," O. S. Morgan.	105
Feb. 5	— "Drainage, Importance and Methods," Jared Van Wagenen, Jr., Lecturer, New York State Farmers' Institute	95
Feb. 12	— "Manures and Fertilizers," O. S. Morgan	110
Feb. 19	— "Humus and Lime," Prof. Alva Agee, N. J. Agricultural Experiment Station	110
Feb. 26	— "Corn: Seed, Culture and the Silo," O. S. Morgan	105
March 5	— "Timothy Hay — A Profitable Crop on Some Eastern New York Farms," Jared Van Wagenen, Jr	100
March 12	— "Clover, Alfalfa and other Legumes," O. S. Morgan	110
March 19	— "Essentials of Vegetable Gardening," Director R. L. Watts, Pennsylvania State College of Agriculture and Agricultural Experiment Station	120
March 26	— "Potato Growing in the East," Prof. Alva Agee	105
	WEDNESDAY	
March 31	— "Tree Fruits," Dr. U. P. Hedrick, Horticulturist, New York Agricultural Experiment Station, Geneva, N. Y.	80
	FRIDAY	
April 9	— "Small Fruits," O. M. Taylor, Foreman in Horticulture, New York Agricultural Experiment Station, Geneva, N. Y.	92
April 16	— "Swine on New York Farms," F. C. Minkler, Animal Husbandman, State College of Agriculture, New Brunswick, N. J	70
April 23	— "Dairy Farming in New York State," Jared Van Wagenen, Jr.	70
	Total	1,512

"FOLLOW-UP" WORK

This work, also, was greatly handicapped owing to lack of funds. Two hundred and three farms were visited, 161 less than in 1913-14. Had the means been available to meet the requests for work of this kind, more rather than less of it would have resulted. This in spite of the fact that such work is done only in counties having no farm bureaus. Aside from the value to individuals and neighborhoods as set forth in the illustrations given below, this work has been the forerunner and inspirer of the organization of farm bureaus, the county of Tioga being a notable example. In this, his home county, Mr. D. P. Witter has done much work of this sort, with the result that a farm bureau organization has already been formed with over four hundred members — much more than the necessary ten per cent of the farmers required before a bureau can receive state and federal aid. In 1916 they will secure their own farm bureau manager. In the meantime Mr. Witter will do all possible for the farm bureau directly under the Bureau of Farmers' Institutes.

The following experiments with fertilizers were made on the farm of The Empire State Pickling Company, Phelps, N. Y., 1914, under the direction of D. P. Witter in extension work.

For many years men well informed in the results from the use of commercial fertilizers, have realized that when acid phosphate was used on the land in liberal quantities the use of potash was not always profitable; yet most farmers have continued to buy a larger quantity of potash than of the other elements of plant food, usually buying a 2-8-10 mixed fertilizer. Agents have recommended this mixture, as the profit on this grade of goods is much more than on the chemicals or on a better grade of mixed fertilizers.

Results from the following experiment would seem to indicate quite clearly, so far as one experiment will prove anything, that where lime and acid phosphate are used on land other than muck land, in the glacial sections of this country, the use of potash is not always profitable. Cabbage was taken for the experiment, thereby giving three checks on the work — the total weight, weight per head, and number of marketable and unmarketable heads.

The land chosen for the experiment had grown cabbage the year previous (1913). No manure was used either year. In the spring of 1914 two tons of burned lime per acre had been applied as a preventive of club root. The location of the plats was near the middle of the field one way and reached across the field the other way, being forty-six rods and eleven feet long. The soil appeared to be very uniform in quality. The plats were two drill-widths (13½ feet) wide. The fertilizer was applied by going across the field and back with an eleven-hoe drill.

The two rows nearest the center of each plat were chosen to eliminate all danger of effect from fertilizers on adjoining plats, and the following results were found:

PLAT	Rows	WEIGHT PER ACRE		Number good heads	Number light heads	Pounds per head	POUNDS FERTILIZER PER ACRE			INCREASE PER ACRE		Cost of fertilizers per acre	Increase in receipts per acre	Profit per acre
		Tons	Pounds				Nitrate	Acid phosphate	Potash	Tons	Pounds			
1	55–56	22	150	966	30	4.57	60	800	....	9	250	$5 60	$45 62	$40 02
2	60–61	22	1,150	976	41	4.62	60	800	212	9	1,250	10 90	48 12	37 22
3	64–65	14	1,700	886	102	3.35	60	....	212	1	1,800	5 30	9 50	4 20
4	69–70	12	800	815	186	3.05	60	....	....	....	1,100	1 50	*2 75	*4 25
5	72–73	12	1,900	910	91	2.84	Check, no fertilizer.			....	......	....	....	....
6	76–77	19	1,500	942	52	4.20	600 lbs. chemicals, at $24.50.			6	1,600	7 35	34 00	26 65
7	83–84	18	900	900	71	4.10	600 lbs. 2-8-10, at $24.50.			5	1,000	7 35	27 50	20 15

* Loss.

The Empire State Pickling Company had practiced the use of a mixed fertilizer, 2-8-10, which cost them $24.50 a ton in car lots. Six hundred pounds per acre of this mixture was used on all their cabbage lands, and was used on plat No. 7.

For plat No. 6 a combined fertilizer was made by mixing nitrate of soda, acid phosphate and muriate of potash, costing the same per ton and the same amount was used as on plat No. 7.

The nitrate of soda seemed to produce a negative result. Therefore, the cost of nitrate is not considered on plats where mineral fertilizers were used.

Plat No. 5 did not receive any fertilizer, and the difference in production between that plat and the others was considered due to the fertilizer used.

Considering the gross weight per plat, the number of marketable heads and the weight per marketable head, all of which agree with only slight variation, the results would indicate that acid phosphate for cabbage on that land — a sandy loam with some clay — under its present conditions, was the most profitable of any of the chemicals or mixtures used.

Where 212 pounds of potash was used without acid phosphate it was worth 3,800 pounds of cabbage, but when used with 800 pounds of acid phosphate, it was found worth only 1,000 pounds of cabbage an acre, for it produced only 1,000 pounds more cabbage than where acid phosphate was used alone.

Where acid phosphate was used, nearly all the potash required by the crop was set free; therefore, where potash was used, it was at a loss of over fifty per cent.

The market price of cabbage the day this crop was harvested was $5.00 a ton, and the above figures were made on that basis.

Experiments of the same nature are being carried on this year on the same farm. Each plat is larger than last year, and each of the seven plats is in duplicate, in order that variation in soil may be eliminated as far as possible.

The photograph here shown is of winter vetch and rye on farm of Mr. E. P. Browne, Savannah, Wayne county, sowed under the direction of Mr. D. P. Witter. He persuaded this farmer to save some for seed last year, and on an acre and a quarter he gathered and sold sixteen bushels of vetch seed at $6.60 a bushel, or over $100 from the acre besides the fodder. This year, he has in a young orchard ten acres of vetch and rye which has been cut for seed and threshed with the following results:

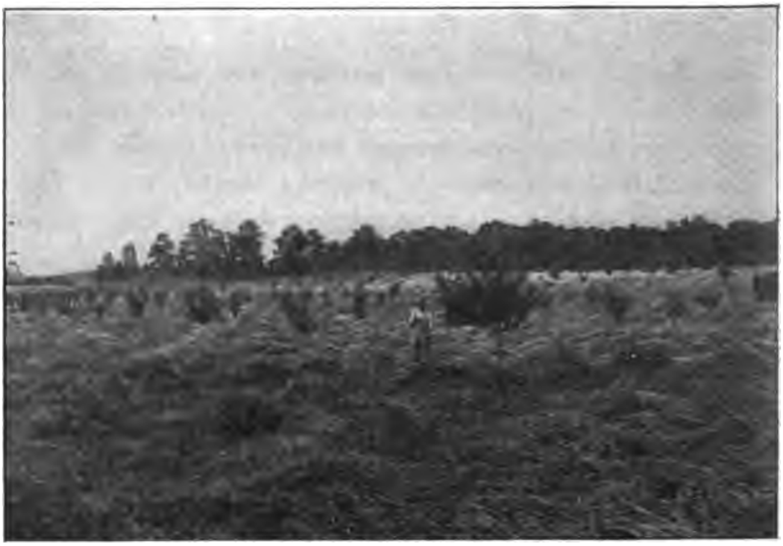

FIG. 497. WINTER VETCH AND RYE ON FARM OF E. P. BROWNE, SAVANNAH, N. Y.

Total number of bushels	270	
Amount of vetch, the ratio being 20 per cent or more	54	
Number of bushels of rye	216	
He has been offered $1.20 a bushel for the rye, or		$259 20
He has been offered $9.00 a bushel for the vetch, or		486 00
		$745 20

Although the results shown above were not obtained until after the close of the calendar year, they are of such interest that it was deemed advisable to include them in this report.

COUNTY SURVEY WORK

An entirely new line of work was undertaken in the fall of 1914 in the counties of Saratoga, Washington and Warren, contributary to Glens Falls. At the request of the Chamber of Commerce of that city, Mr. John A. Ennis, of the Bureau of Farmers' Institutes, with Mr. H. E. Babcock, Assistant Director of Farm Bureaus, spent most of a week in the above-mentioned territory, ascertaining the character of the agriculture with particular attention to what portion of the products of the farms were marketed in Glens Falls, a wealthy city of 16,000. With the exception of poultry, the bulk of the products consumed in the city, which could be grown in the surrounding country, came from a distance. Even a large portion of the milk came from Vermont. One dealer paid over $400 for western-boxed apples. The bulk of the potatoes, mutton and pork were also brought from a distance, yet the surrounding country did once and can still produce all these things, and at their best. Most of it is excellent farming land. A difference was found in the production of dairies of from $45 to $125 per cow. Here was evidently a lack of coordinate effort and local leadership. A report of the survey was later made at a meeting of citizens at Glens Falls. Probably a farm bureau will eventually result. These facts will make valuable material for institute workers in this section during the coming winter.

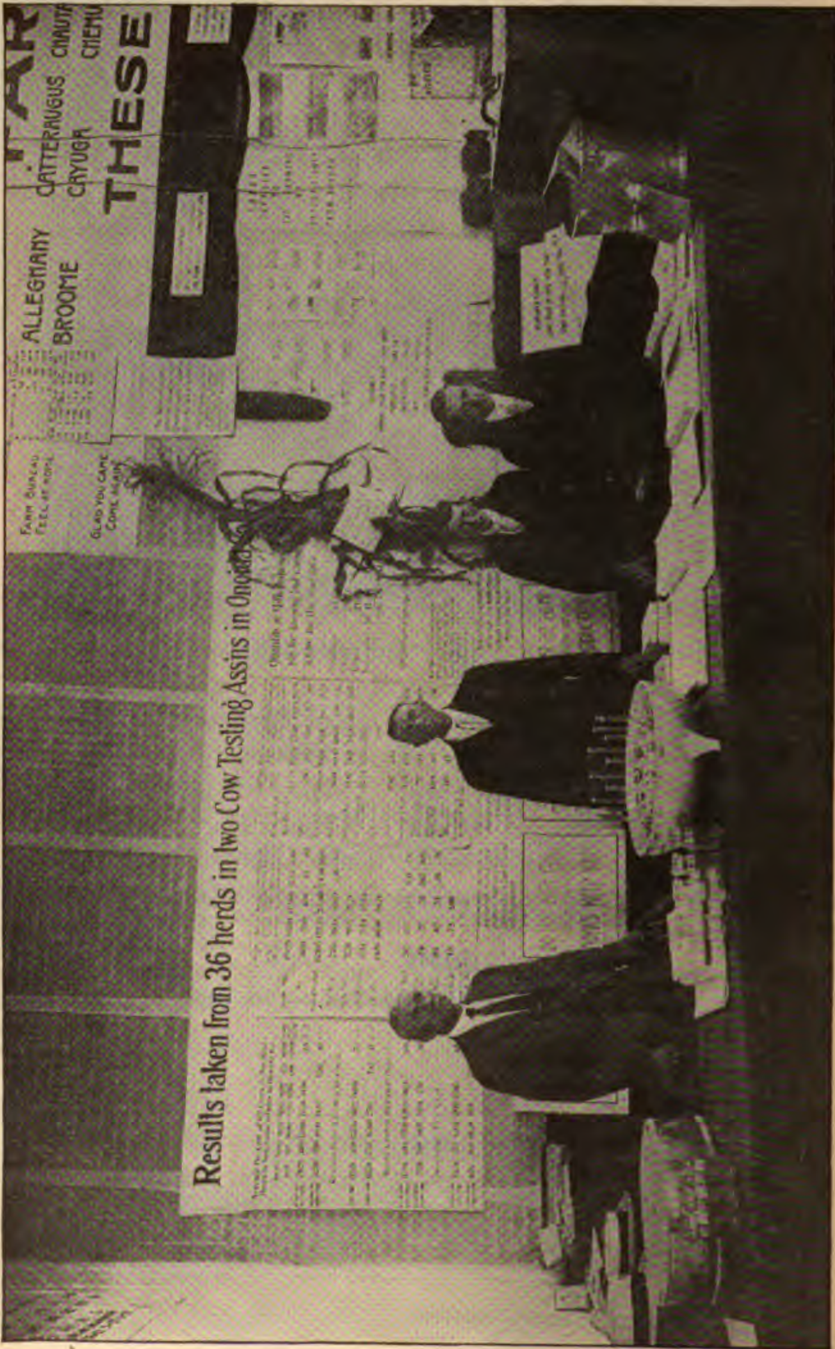

FIG. 498. COW TESTING BOOTH AT STATE FAIR, 1914.

COW TESTING ASSOCIATIONS

With gratification and some pride attention is called to the tabulation of the cow testing association work. Despite the loss of eleven associations, the handicap from lack of funds during the summer which prevented any pioneer work, and the spread of the foot and mouth disease during the winter, there are now doing business thirty-seven associations, with approximately 930 members and 19,963 cows. Were the three associations organized since the close of the calendar year, June 14, added, New York would have one-fourth of all the associations in the entire United States — this without a dollar of appropriation other than that from the institute funds.

The maintenance and advance of the work has been made possible by the cooperation of the farm bureau managers. Only three associations have been organized in counties in which there are no farm bureaus. The illustrations given in the following pages from the report of Mr. A. J. Nicoll, bear testimony to the value of this work.

Mr. John A. Ennis spent the month of January at the State School of Agriculture at Alfred instructing a class of young men from the dairy division in cow testing work. From this class have come some of our most efficient testers. Mr. F. G. Helyar, Director of the State School of Agriculture at Morrisville, has also specialized in training young men for similar service.

LIST OF COW TESTING ASSOCIATIONS IN OPERATION JUNE 14, 1915

COUNTY AND ASSOCIATION	DATE BEGAN WORK	PRESIDENT	TESTER
BROOME:			
Susquehanna Valley	Nov. 11, 1914	A. B. Griffin, Susquehanna, Pa., R. 6	John A. Sanford, Windsor.
CATTARAUGUS:			
Conewango Valley	April 1, 1915	Glenn W. Hall, Dayton	E. J. Sardeson, Fredonia.
Ischua Valley	April 1, 1912	E. B. Farwell, Ischua	Paul L. Green, Ischua.
CHAUTAUQUA:			
Carroll	April 1, 1911	H. W. Ayres, Jamestown	Ernest Engdahl, care H. W. Ayers.
CHEMUNG:			
Northern Chemung	April 16, 1914	Oscar Kahler, Elmira	J. A. Birkland, care Harry Strivings, Corning, R. 1.
CHENANGO:			
New Berlin	May 1, 1915	G. B. Low, New Berlin	Wm. E. Day, New Berlin.
West Chenango	Mar. 7, 1915	C. E. Greene, Greene	James Ball, Greene.
CORTLAND:			
Cortland County Central Dairy Improvement Association	June 17, 1914	Homer H. Jones, Homer	Harry Bentley, Cortlandville.
Cortland County Dairy Improvement Association	June 1, 1914	Bert Leamy, Truxton	A. B. Brown, Homer.
Cortland County South Dairy Improvement Association	June 11, 1914	Richard Phalen, Marathon	Stewart F. Greene, Marathon.
DELAWARE:			
Andes-Bovina (Delhi and Bovina combined)	May 1, 1911	A. J. Nicoll, Delhi	James Calhoun, Andes.

Bloomville	Mar. 22, 1915	D. I. Cameron, Bloomville	J. H. Tilley, Bloomville.
Cannonsville and Deposit	April 1, 1911	Henry Alexander, Kelsey	Chauncey Hoag, Deposit.
Roxbury	Nov. 1, 1912	Bruce Meade, Roxbury	J. R. Connolly, Roxbury.
Walton	Dec. 10, 1914	J. Q. Barlow, Beerston	Earl Love, Walton.
ERIE:			
Chaffee-Sardinia	June 1, 1915	Jesse Ward, Chaffee	Roland F. Bucknam, East Aurora
JEFFERSON:			
Jefferson County No. 1	April 17, 1912	Fred B. Clark, Carthage, R. D. 3	Chas. Tifft, Lacona.
Smithville-Chaumont	May 14, 1913	G. S. Robbins, Adams, R. 4	Bert Shannon, Smithville.
LEWIS:			
Lowville	April 20, 1914	Eugene Arthur, Lowville	Leon Olmstead, Lowville.
ONEIDA:			
Holland Patent (formerly Westernville)	April 15, 1913	F. H. Thompson, Holland Patent	Millard Thayer, Holland Patent.
Oriskany Valley (formerly Knoxboro)	May 3, 1913	John W. Weaver, Clinton, R. D.	Oscar Agne, Verona.
Vernon-Verona	Mar. 1, 1914	Chas. Stellwagon, Verona	Ray Taylor, care C. Stellwagon.
Waterville (formerly Sangerfield)	Dec. 15, 1912	Sinclair Coventry, New Hartford	C. R. Hart, care S. Coventry.
ONONDAGA:			
Farm Bureau Assn., No. 3 (Marcellus, Otisco, Tully and Fabius)	July, 1914	*	Floyd Tucker, Navarino.
Farm Bureau Assn., No. 4 (Lysander and Van Buren)	June, 1914	*	O. S. Kelly, Lysander.
OTSEGO:			
Cooperstown	Nov. 1, 1914	Claude Whipple, Cooperstown	John H. Blake, Cooperstown.
Otsego, No. 1	Dec. 1, 1912	Andrew Z. Carlton, Morris	Walter Cornell, West Laurens.
Springfield and Cherry Valley	Nov. 9, 1914	Floyd Hooker, Cherry Valley	Robt. J. Harbison, Cherry Valley.
ST. LAWRENCE:			
Stockholm	April 11, 1914	V. H. Ballou, Winthrop	Earl E. Moulton, North Stockholm.

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* No officers elected.

LIST OF COW TESTING ASSOCIATIONS IN OPERATION JUNE 14, 1915 — *Concluded*

COUNTY AND ASSOCIATION	DATE BEGAN WORK	PRESIDENT	TESTER
TOMPKINS:			
Ithaca	May 1, 1908	Dept. of Dairy Iudustry, Cornell University	L. E. Filkins, North Lansing.
ULSTER:			
Rondout Valley	May 1, 1915	*	Howard Fleming, Walden.
Wallkill	Dec. 1, 1914	Frank Du Bois, Wallkill	Hugh E. Du Bois, Wallkill.
WASHINGTON:			
Hartford-Hebron	April 24, 1913	E. B. Norton, Hartford	Chas. N. Eddy, Hartford.
WYOMING:			
Attica	Nov. 1, 1914	C. H. Waite, Attica	R. A. Daggett, Attica.
Java	July 1, 1914	A. E. Nichols, Java	Theo. Clausen, Java.
Perry-Pike-Gainesville	June 1, 1913	John L. Fuller, Castile	Harold Peet, Pike.
Warsaw	July 14, 1914	H. W. Avery, Warsaw	J. B. Giles, Warsaw.

* Officers not yet chosen.

ADVANTAGES OF A COW TESTING ASSOCIATION

A. J. Nicoll, Delhi, N. Y.
Farmers' Institute Lecturer

In order to show some of the advantages of membership in a cow testing association we have compiled the following tables from the record of a herd of 23 cows in one of the Oneida County Associations.

The yearly record of the entire herd shows that the owner is deriving over half of his profits from his best ten cows, which made $506.74. His poorest eight cows cleared only $214.56 over their feed.

TABLE I

Twelve-Month Record of an Oneida County Herd for the Year Ending April 30, 1915

Cow No.	Age	Lbs. milk	Per cent fat	Lbs. fat	Value of product	Cost of rough-age	Cost of grain	Total cost feed	Profit over feed
1.......	5	6,834	3.7	253.78	$91 31	$27 03	$16 83	$47 45	$47 45
2.......	6	7,663	4.0	311.00	108 16	26 36	28 96	55 32	52 84
3.......	3	5,658	3.3	191.16	76 50	27 03	19 16	46 19	30 31
4.......	13	6,606	3.8	255.47	88 53	26 36	18 96	45 32	43 21
5.......	3	6,067	3.4	208.54	81 14	27 03	20 55	47 58	33 56
6.......	3	5,721	3.6	209.59	80 06	26 36	23 64	50 00	30 06
7.......	4	6,665	3.5	238.23	95 16	26 36	28 29	54 65	40 51
8.......	5	6,229	3.7	232.53	82 81	27 03	20 29	47 32	35 49
9.......	7	7,476	2.9	222.69	100 30	26 36	22 85	49 21	51 09
10.......	5	6,884	4.1	284.46	96 76	26 36	24 77	51 13	45 63
11.......	3	7,418	3.5	259.81	105 88	26 36	28 29	54 65	51 23
12.......	11	6,870	3.6	250.30	90 76	27 03	18 97	46 00	44 76
13.......	4	6,915	3.4	240.11	92 95	27 03	19 41	46 44	46 51
14.......	7	5,853	4.0	239.57	78 00	27 03	21 25	48 28	29 72
15.......	3	5,715	3.9	226.63	79 59	26 36	23 80	50 16	29 43
16.......	13	5,766	3.8	223.61	76 80	27 03	20 29	47 32	29 48
17.......	3	4,651	3.7	172.38	63 36	27 03	18 74	45 77	17 59
18.......	7	8,460	3.9	337.63	120 18	26 36	31 05	57 41	62.77
19.......	8	7,870	3.7	293.41	108 60	26 36	27 02	53 38	55 22
20.......	3	5,006	3.8	191.68	66 78	27 03	19 16	46 19	20 59
21.......	8	5,719	3.7	217.25	75 31	27 03	16 57	43 60	31 71
22.......	5	7,370	3.5	264.92	98 77	27 03	22 50	49 53	49 24
23.......	6	6,725	3.2	215.44	90 49	27 03	20 56	47 59	42 90
Average per cow..	...	6,528	3.6	240.87	$89 05	$26 74	$22 25	$48 99	$40 66

Total profit for herd, $921.30; best fifteen, $702.41; best ten, $506.74.

In order to show the necessity of weighing and sampling each month we selected from the above herd, cows 6, 10, 13 and 25, and give their production of milk, and butter fat test, for each month in the year. Note the difference in total production.

TABLE II

SHOWING THE NECESSITY OF WEIGHING AND SAMPLING EACH MONTH

MONTH	Cow No. 6		Cow No. 10		Cow No. 13		Cow No. 25	
	Lbs. milk	Per cent fat	Lbs. milk	Per cent fat	Lbs. milk	Per cent fat	Lbs. milk	Per cent fat
May	1,169	3.0	1,014	3.2	887	3.2	1,212	3.4
June	873	3.4	858	4.0	648	3.2	825	2.[illegible]
July	809	4.2	750	3.4	634	4.0	713	3.[illegible]
August	729	3.6	682	4.4	443	4.0	744	3.1
September	648	4.2	555	3.6	395	4.4	702	3.[illegible]
October	512	4.2	527	4.2	315	5.4	645	4.0
November	309	5.2	114	4.4	53	5.4	174	2.[illegible]
December	149	5.0	Dry...	....	276	3.6	Dry...	...
January	152	5.0	Dry...	....	1,119	3.8	Dry...	...
February	314	4.4	Dry...	....	988	2.8	Dry...	..
March	551	4.0	797	3.6	955	3.2	546	3.[illegible]
April	393	3.8	933	3.6	915	3.0	1,191	3.[illegible]
Total	6,608	3.8	6,230	3.7	7,418	3.5	6,725	3.[illegible]

In order to show the necessity for continuous weighing of the milk of each cow we have selected cows No. 4, 13, 21 and 2[illegible], giving their production of milk for each month of the year. Note that the cow giving the largest production of milk in a month does not always give the most milk in a year.

TABLE III

SHOWING THE NECESSITY FOR CONTINUOUS WEIGHING

MONTH	Cow No. 4	Cow No. 13	Cow No. 21	Cow No. 23
May	967	877	1,128	1,119
June	702	648	915	864
July	549	434	731	800
August	543	434	682	775
September	360	395	471	555
October	208	315	372	567
November	Dry	53	38	198
December	Dry	276	Dry	60
January	Dry	1,119	588	Dry
February	148	988	1,028	Dry
March	1,147	955	1,029	100
April	1,035	915	888	681
Total	5,659	7,419	7,870	5,719

For the purpose of showing that the cow that gives the largest amount of milk in a day is not always the largest producer in the herd, we selected cows No. 3, 4, 6, 10, 11, 13, 17 and 25. Note that neither of the largest producers in a day was the largest or most profitable producers for a year, and that No. 17, whose largest daily amount was only 18.9 pounds, gave more fat than 4, 11 or 25.

TABLE IV

SHOWING THAT THE COW GIVING THE LARGEST QUANTITY OF MILK IN A DAY DOES NOT ALWAYS GIVE THE MOST MILK AND MAKE THE MOST PROFIT IN A YEAR

Cow No.	Age	Best day's milk	Total yield for the year	Total fat for year	Profit over feed for the year
3	6	35.5	7,664	311.0	$52 84
4	3	37.0	5,658	191.6	30 31
6	13	37.7	6,606	255.4	43 21
10	5	32.7	6,229	232.5	35 49
11	7	35.4	7,476	222.6	51 09
13	3	37.7	7,418	259.8	51 23
17	3	18.9	5,715	226.6	29 43
25	6	31.1	6,725	215.4	42 90

This milk was sold on a flat price. If it had been sold on a butter fat basis the smaller yielding cows would have made a much larger profit over their feed.

Some farmers think that weighing a cow's milk only once in a month, and estimating the yield by multiplying this by the number of days in the month, does not come very near to the actual production.

Table V gives the result of weighing once a month compared with the actual monthly yield weighed every day.

TABLE V

RESULT OF WEIGHING MILK ONCE A MONTH COMPARED WITH THE ACTUAL MONTHLY YIELD WEIGHED EVERY DAY

Cow No.	Calculated yield	Actual yield	Difference	Cow No.	Calculated yield	Actual yield	Difference
1	666	651	–15	11	594	579	–15
2	600	579	–21	12	868	885	+17
3	587	576	–11	13	774	754	–20
4	666	667	+1	14	330	342	+12
5	300	307	+7	15	977	998	+21
6	852	863	+11	16	1,062	1,057	–5
7	300	292	–8	17	453	444	–9
8	672	693	+21	18	549	566	+17
9	711	703	–8	19	683	648	–35
10	330	342	+12	20	1,094	1,086	–8
Total	5,684	5,673	11		7,323	7,259	64

In Table No. VI we have the result of weighing three times per month compared with the calculated yield from weighing once a month.

TABLE VI

Cow No.	Calculated yield once a month	Calculated yield three times a month	Difference
	Lbs.	*Lbs.*	
1	834	804	30
2	963	969	6
3	933	909	24
4	855	864	9
5	570	570	....
6	711	735	24
7	498	495	3
8	873	879	6
9	252	261	9
10	1,056	1,020	36
Total	7,545	7,506	39

That many dairymen who had not been weighing the milk of the individual cow are now giving attention to this important matter is shown by the great increase in the sale of milk scales during the last year. One dealer in dairy supplies, when asked how his sale of milk scales last year compared with the year before, writes: " From July 1, 1913, to July 1, 1914, we purchased 66 sets of milk scales. From July 1, 1914, to July 1, 1915, we purchased 334 milk scales. We think we sold all of these during that time."

The demand for blanks for the keeping of records has been much greater during the last year.

The following table shows the results of two years' work in twelve herds in the Oneida County Associations, giving the number of cows in each herd each year, quantity of grain, total cost of feed, and profit over feed per cow.

TABLE VII

HERD No.	Number cows, 1914	Number cows, 1915	Pounds grain, 1914	Pounds grain, 1915	Cost feed, 1914	Cost feed, 1915	Increase in profit over feed
1	25	29	1,734	1,679	$47 29	$45 78	$7 38
2	23	16	1,818	1,462	48 17	47 17	19 86
3	35	31	1,479	1,966	41 54	54 34	5 57
4	14	17	405	1,150	63 10	45 68	1 54
5	27	31	1,297	1,623	49 94	42 22	91
6	37	36	930	1,016	37 69	42 72	14 16
7	12	10	2,308	1,745	......	......	17 89
8	14	16	1,692	1,342	......	......	1 62
9	20	27	2,204	1,115	......	......	8 65
10	17	22	1,150	491	......	......	14 70
11	12	10	1,620	1,619	......	......	19 36
12	21	23	386	235	......	......	17 49

Note that herds 2, 7 and 11 made the largest gain, and reduced the number of cows in the herd and the quantity of grain fed per cow.

Table VIII gives the three-year record of the herd of March Farrington of the Delhi Association at Delhi, N. Y. Mr. Farrington won the premiums at the 1914 State Fair, given by the State Fair Commission for the greatest increase of milk and butter-fat production over the previous year, in any herd in a New York State cow testing association. Note that he has been able to still further increase his production.

TABLE VIII

YEAR	No. cows	Pounds milk	Pounds fat	Value of product	Cost of feed	Profit over feed
1912	41	179,894	8,544	$3,257 96	$1,972 86	$1,288 83
1913	39	190,018	9,274	3,887 91	1,830 31	2,057 60
1914	42	229,547	10,832	4,710 08	2,283 10	2,426 98

AVERAGE FOR HERD

YEAR	Number of cows	Pounds milk	Pounds fat	Value of product	Cost of feed	Profit over feed
1912	41	4,387	208	$79 46	$48 12	$31 46
1913	39	4,882	238	99 69	46 93	52 74
1914	42	5,465	258	112 14	54 35	57 79

This milk was sold to the Sheffield Slawson Decker Co. on a butter-fat basis. Note that with a larger herd and more liberal feeding the profit over feed was increased $5.05 per cow. The increase in profit over feed was $26.33 more per cow than in 1912, or, for the entire herd of 42 cows, a gain of $1,105.86.

PUBLICATIONS

Pursuing the policy inaugurated at the beginning of the present directorate, the institute bureau has continued to supplement the spoken by the written word. The former, though inspiring, may be misunderstood; the presentation may be faulty — at best it is transitory, and the number it can reach are comparatively few. The latter, although lacking the vivifying effect of the individual personality and the human voice, are the carefully prepared thoughts of specialists set down in black and white. They are definite, enduring, and may be preserved for study. They are for the many, and travel far afield. Hence, this phase of the work is being magnified, both from the standpoint of instruction, and with a desire to add to the helpful agricultural literature of the state.

With this end in view there was issued in October, 1914, Bulletin No. 64 on "The Swine Industry of New York State," a volume of 200 pages, containing thirty articles by twenty-three different writers, with fifty-six illustrations. The table of contents and authors follows:

Introduction ....
Principles Involved in Breeding Swine, Eugene Davenport ....
Houses and Enclosures, H. B. Harpending ....
Permanent Hog Houses, Dr. Ellis M. Santee ....
Essentials in Profitable Pork Production, Edward van Alstyne ....
Forage Crops for Supplementary Feeding, H. B. Harpending ....
The Value of Forage Crops in Pork Production, F. C. Minkler ....
Some Grain Rations for Swine, F. C. Minkler ....
Feeding Hotel Kitchen Refuse to Swine, J. G. Curtis ....
Tankage and Bone Meal for Hogs, U. S. Department of Agriculture ......
Breeds of Swine ....
    The Berkshire, Frank S. Springer ....
    The Poland-China, A. M. Brown ....
    The Essex, Charles S. Plumb ....
    The Ohio Improved Chester, O. C. Vernon ....
    The Chester White, F. F. Moore ....
    The Cheshire, E. S. Hill ....
    The Large English Yorkshire, J. G. Curtis ....
    The Small Yorkshire, Charles S. Plumb ....

Breeds of Swine — *Continued:*
The Victoria, Charles S. Plumb....................................
The Suffolk, Charles S. Plumb....................................
The Duroc-Jersey, R. J. Evans....................................
The Tamworth, the Ideal Bacon Hog, E. N. Ball....................
The Thin Rind or Hampshire, Charles S. Plumb.....................
The Mule-Foot, J. N. McPherson...................................
Sanitation, Dr. E. L. Volgenau...................................
A Few of the Common Diseases of Swine, Dr. M. Hamilton...........
Hog Cholera, Dr. Charles Linch...................................
Swine on State Institution Farms, James D. Edwards...............
Home or Retail Marketing of Pork Products, Edward van Alstyne.....
Market Types and Marketing, R. S. Stacy..........................
Pork Products as a Food, Ida S. Harrington.......................
Statistics ....
Index ....

In November, 1914, Bulletin No. 65 was issued, "The Poultry Industry of New York State," with twenty-four articles by sixteen writers, and 156 illustrations, with the following table of contents and authors:

Introduction ....
The Minorca, Mrs. George E. Monroe...............................
Leghorns, Irving F. Rice...
Barred Plymouth Rocks, E. B. Thompson............................
Minor Breeds of Plymouth Rocks...................................
The Wyandotte, A. J. Gies..
Rhode Island Reds, George W. Tracey..............................
Orpingtons, Andrew S. White......................................
The Asiatics ....
Breeding Poultry for Egg Production, Prof. James E. Rice.........
Incubation, Robert P. Trask......................................
Brooders and Brooding, Prof. Harry R. Lewis......................
Rearing Chickens, L. M. Hurd.....................................
Feeding for Egg Production, Robert P. Trask......................
Poultry House Construction, Robert P. Trask......................
Some Common Poultry Diseases and Simple Methods for Their Control, Prof. Harry R. Lewis...
Sanitation and Disease Prevention, Prof. Harry R. Lewis..........
Market Egg Problems, Earl W. Benjamin............................
Ducks, Frances E. Wheeler..
Turkeys, Frances E. Wheeler......................................
Domestic Geese, Sarah A. Little..................................
Squab Raising, George L. Gillingham..............................
Guinea Fowls, B. J. Dodge..
Poultry as a Food, Ida S. Harrington.............................

Statistics
Index

In April, 1915, Bulletin No. 70, "The Vegetable Industry of New York State" was issued. It contains 368 pages with forty-one articles by thirty-one contributors. Following is the table of contents with authors:

Introduction
Market Gardening in New York State, A. E. Wilkinson
Vegetable Growing on Long Island, W. B. Nissley
Truck Gardening on the Uplands of Western New York, W. E. Evans
Muck Soils in New York: There Nature and Distribution, E. O. Fippin
Growing Vegetables on Muck Lands, Paul Work
The Canning Industry from the Grower's Standpoint, S. J. Cook
Canning on the Farm, C. O. Warford
Why Organize a Canning Club, E. H. Forristall
Vegetable Forcing in New York State, H. W. Schneck
The Farm Garden, William Hotaling
Soil and Fertilizers for Vegetables, J. F. Barker
Good Seed, C. E. Myers
The Seed Business from the Dealers' Standpoint, H. W. Gordinier
Growing Early Plants, E. H. Hallett
Diseases of Vegetables, J. C. Jagger
Some Insects Injurious to Vegetables, Glenn W. Herrick
Irrigating Vegetables in New York, Paul Work
Marketing Vegetables, C. R. White
Vegetable Gardening at Cornell, Paul Work
New York State Vegetable Growers' Association and its Work, Paul Work
Exhibition of Vegetables, Paul Work
Potatoes, Edward van Alstyne
Onions, W. H. Ellis
Tomatoes, C. C. Hulsart
Cabbage, E. N. Reed
Cucumbers, C. R. White
Cauliflower, A. E. Wilkinson
Brussels Sprouts
Celery, Henry Greffrath
Asparagus, C. C. Hulsart
Melons, Chas. D. Barton
Squashes and Pumpkins
Peas, A. E. Wilkinson
Beans, H. E. Cox
Lettuce, W. L. Bonney
Sweet Corn, A. E. Wilkinson
Pop Corn, J. G. Curtis
Mushrooms, P. K. Nott

Horse Radish, Edward van Alstyne....
The Importance of Vegetables in the Dietary, Ida, S. Harrington....
Legal Weights and Measures of Vegetables Sold in New York State, J. H. Farrell....
Guide for Vegetable Growers (Table)....
Statistics....
Reference Books for Vegetable Growers....
Index....

At the request of the Department of Education, the following circular was prepared for distribution among the schools of the state:

CIRCULAR 113 PREPARED BY DR. G. G. ATWOOD, CHIEF, BUREAU OF HORTICULTURE, AND EDWARD VAN ALSTYNE, DIRECTOR OF FARMERS' INSTITUTES, DEPARTMENT OF AGRICULTURE

ESSENTIALS TO SUCCESSFUL PLANT LIFE

EDWARD VAN ALSTYNE

In order that a plant may grow vigorously it is necessary that it should have food of the right kind placed where it can readily obtain it and in quantities sufficient for its needs.

Boys and girls, colts and calves, when they are very young, live chiefly on milk. When they grow older their digestive powers are stronger; the former eat bread, vegetables and meat, the latter grain and hay or grass. The boys and girls would not thrive on the grain and hay nor the colts and calves on bread and meat. Neither would make much growth if they had only a little food.

Plants are very like animals. They need the most digestible kind of food when they are young. As they grow older and stronger they can take that which is less simple. If they have only a part of what they need they will be weak and sickly, like a half-starved child.

Young animals cannot go far for milk. However plenty it may be even a short distance from them it will do them little good, or if it is near by and locked up. When they grow older they can go after their food.

Young plants, too, must have their food near them. As they grow older the roots travel through the soil seeking it. The ends of some apple tree roots were once found over forty feet from the tree. They had gone under a hard road and a stone wall to find food in a garden. Small plants would have died of hunger because their roots would not have been able to go so far. These apple trees did not grow so well or bear as much fruit as others which had plenty of available plant food near them.

Plants are unlike animals in that they can take food only in a liquid form. They drink through the little threadlike hairs at the ends of their roots.

With these simple facts in mind let us consider the soil as the home of plants containing their food, what it consists of, and how they obtain it.*

HOW SOILS ARE MADE UP

Soils are made up of particles of rock and decayed vegetable matter. The particles may be as fine as sand or as coarse as gravel. If they are very fine they lie so closely together that the soil becomes hard, and only very large, strong plant roots can get through. If very coarse, they are so open that the water escapes and they quickly dry out from wind and sun. The best soils for plants are those which are neither very fine nor very coarse. Neither would grow anything worth while unless there was mixed with these soil particles decayed vegetable matter. This allows the air and sun to enter and the plant roots to move readily after the food. It also helps the soil to hold water. A good soil, then, is one, the particles of which are not too coarse or too fine, and which is well filled with vegetable matter.

HUMUS

Humus is decayed vegetable or animal matter. It makes no difference how full a soil may be of plant food, it will be of little value to the plant without humus. As we have seen it makes the soil porous and helps to hold moisture. It also contains some plant food and in its decay there, an acid is formed which helps to dissolve the locked-up plant food in the soil particles.†

This humus may come from fallen leaves, living or dead plants, stubble, roots, sod, or manure. Many soils said to be worn out will again grow good crops if they are well supplied with humus.

PLANT FOOD

There are four principal foods which are necessary for plants to have in order to make a good growth and bear fruit. Some of their names may seem strange, but when remembered and understood, they will make certain studies, like chemistry, easier and more interesting.

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* See Bulletin No. 50, Department of Agriculture.

† See Cornell Reading Course Lesson, Vol. III, No. 50, Soil Series No. 3.

Nitrogen

This makes plants grow quickly as well as making them green. When plants make very little growth and look pale and yellow, it is a sure indication that they need nitrogen. Too much makes the plant weak and prevents fruitfulness. The air is full of nitrogen in the form of gas. Snow, rain and dew always bring down a little. At Niagara Falls there is a factory where men actually take the nitrogen of the air and convert it into a substance which can be handled. As yet it costs too much in this form for the farmer to use it to supply nitrogen for his plants.

Certain plants called "legumes," such as clover, peas and beans, can take this nitrogen of the air and by means of their leaves store it up in little kernels, called nodules, on their roots, which decay and feed the plant. There is much nitrogen in manure, particularly if the liquid is saved.* It is found in fertilizers in the form of dried blood, or tankage; also in nitrate of soda, which is the very best form of commercial nitrogen. This looks like coarse salt and comes from Chili in South America.** If the pupils can secure some of this and will sow it on the grass in early spring so as to form their initials, they can soon read them because of the dark green color of the grass where it was sowed. Nitrogen costs from fifteen to twenty cents per pound. It is the most expensive source of plant food and yet the only one we get for nothing — from the air by the aid of the legumes.

Phosphoric Acid

This helps to form the seed of the plant and to give it a healthy growth. Soil particles are full of it. Chemists tell us there is enough in the first foot of soil to grow good crops for at least a hundred years, and no one knows how much more there is below which is being brought up by water and earth worms. Most of this is locked up and plants cannot use it unless it is unlocked and dissolved. There is a moderate quantity in the solid part of the manure. Ground bone contains between twenty-three and twenty-four pounds of phosphoric acid to each one hundred pounds. Nearly half of this is locked up too and has to decay before plants can get it. Most of that used in fertilizers comes from North Carolina, Tennessee and Florida, where it is found in great beds as a soft rock.† After it is taken out it is washed, ground and treated with sulphuric acid, which unlocks the phosphorus and leaves it all ready for plants to use as soon as it is dissolved in water. There are from fourteen to sixteen pounds of phosphoric acid in each one hundred pounds of the treated rock, and it costs from four and one-half to five cents per pound of phosphoric acid.

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* See Circular No. 72, Department of Agriculture.

** Pupils look up this country on the map.

Potash

It is important for the plant to have potash in order to make its stalk. Such plants as potatoes, which contain a great deal of starch, seem to require particularly large amounts of it. This too is in the soil in even larger quantities than is phosphoric acid, and clay soils have much more of it than sand. Much of the potash, like the phosphoric acid, is locked up.

How can these two be unlocked? We have already said that the gas from decaying vegetable matter dissolves them. Water is essential. The finer the soil particles the more readily does the plant food dissolve, because the water comes in contact with more surface than if the particles were large. There is nearly as much potash as nitrogen in manure. Much of this, too, is in the liquid. Wood ashes have from five to eight pounds to each hundred pounds of ashes.

Most of the potash in our fertilizers has come from the Stassfurt Mines* in Germany, in the form of kainit, which has twelve pounds of potash to every one hundred pounds of kainit; or in muriate or sulphate containing fifty pounds to each one hundred pounds of the muriate or sulphate of potash. The latter is the purest form and is best to use on delicate vegetables such as celery. Owing to the war in Germany it is this year (1915) almost impossible to obtain any potash at all, so that farmers will have to depend on better cultivation and more vegetable matter in the soil so that they can release more of that which is locked up. A pound of actual potash ordinarily costs about five cents.**

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† See Circular No. 73, Department of Agriculture.
* Pupils look up this place on the map of Germany.
** See Circular No. 73, Department of Agriculture.

Lime

The major part of New York State soils has enough lime to supply the needs of most plants as a food, except clover and alfalfa which contain over forty pounds to the ton. There are also scattered through the state what are known as limestone lands. These are the strongest soils in the state and the best on which to grow clover and alfalfa. Where lime is abundant in the soil animals feeding on the grasses or hay grown on them develop great strength of bone. All grains contain much lime; fruit trees need little. In some cases lime is a needed food and when it is lacking should be supplied. Its most important function is in making sour soils sweet. Clover plants cannot thrive on a sour or acid soil. The grasses grow better on a sweet or alkaline soil. It has a value in improving the mechanical condition of hard or clay soils, the action of the lime making them finer and thus increasing their power to hold water. Abundance of lime in the soil makes the soil water carbonate, which dissolves locked-up mineral plant food much more rapidly than plain water. Note where the drip from the faucet of a soda water fountain on the marble slab underneath has dissolved the marble. Plain water would not do this in a very long time.

Lime before Slaking

Lime Pulverized by Fingers after Slaking

There are three kinds of lime in use for the soil, the valuable element in each being calcium. First, quick or burned lime, the chemical name for which is *calcium oxide.* The burning of the limestone drives off the gases and all moisture. This form, therefore contains the most calcium. If the limestone is of high grade it will contain over 1,900 pounds to the ton of pure calcium. A ton of the burned lime should not cost above six dollars.

Red Clover on Limed and Unlimed Land

Second, slaked or hydrated lime, known as *calcium hydrate.* This is the burned stone reduced to fine grains by water or air. Each ton of the burned lime will contain about five hundred pounds of water. Therefore, in a ton of water-slaked lime in condition to apply to the land, we have only about 1,500 pounds of calcium. If the burned stone sells for six dollars a ton, the water-slaked should be worth $4.55. Often it costs as much or more than that which is burned and unslaked. If it is slaked by exposure to the air it will absorb nearly if not quite all its own weight of air and moisture, and will contain not to exceed 1,100 pounds of calcium and that in the form of carbonate. But it has the advantage of being very fine.

Third, ground limestone, unburned, or *carbonate of lime.* This like the air-slaked will have only a little more than half as much calcium as the burned stone. If it is finely ground and twice as much is applied as of the burned lime, the results will be as good as with the latter. On the same basis of price as the two other forms it should sell at $3.40 per ton.

Marl is a form of carbonate of lime.

To put the matter in another way, fifty-six pounds of quicklime or seventy-four pounds of hydrated lime or one hundred pounds of ground limestone of equal purity and fineness, will furnish the same amount of calcium, and so far as feeding plants, correcting acidity and releasing plant food is concerned, will give equal results and should cost the same.*

Water

However much plant food there may be in the soil, whether locked up or available, and no matter how excellent the condition of the soil is made by the use of lime or by tillage, all would be of little use unless there is an abundance of water to supply all the needs of the plant as well as to dissolve plant food. Grasses and other succulent plants contain not less than seventy-five per cent. of water, fruits about ninety per cent. In addition, great quantities are evaporated by the leaves. A large tree will give off an immense amount of water daily from its leaves. Over three hundred pounds of water are required to produce one pound of dry matter in a plant. Dry matter means what is left after every particle of water has been taken out. We now begin to get an idea of how much water is required and how important it is.

An inch of rainfall means one hundred tons of water on an acre. With an average rainfall over the state of over thirty inches annually there should be enough to grow good crops if all of it could be used, or its fall could be equally distributed throughout the year. Much of this water is lost by falling on the frozen ground and then running off in the streams. At the time of year when the ground is not frozen a great deal is lost when it falls on hard ground or when it comes in showers faster than the earth can take it up. It runs through very loose ground and escapes in the drainage water. Again, the sun's rays draw it up through little tubes in the soil to the surface to escape in the air.

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* See Circular No. 71, Department of Agriculture.

We cannot control the *falling* water but can control that which has *fallen* much better than is usually done. Unless we do this our plants will suffer from too much or too little water. Hard soils should be drained, as these soils hold the water in such quantities that neither light nor air can get in and the soil is therefore very cold. This is what is known as *dead* water. Only water plants such as reeds or pond lilies can live in such soils. They are so wet after a rainfall that they cannot be worked and seeds sown or plants set when they should be. Plants growing on them must root near the surface. After the water has evaporated they suffer more from drouth because their roots are near the surface and the soil beneath is too hard for the roots to penetrate. Plenty of humus to lighten up such soils and absorb the extra water will help to make better homes for the plants.

The wise way is to drain such land with tile. These take out the dead water quickly so that the land can be worked and seeds planted. Sunlight and air get in, making the soil warm, and preparing a nice home for plant roots when they go deep, and in dry weather the plants suffer less than on undrained land. We have seen trees on such land making no growth and their leaves yellow and dropping off. After the land was drained they grew rapidly and the leaves were a rich green.

The water in the soil for the use of plants should be in the form of *film* water; that is, every particle of soil surrounded by a thin film of water, as a lead pencil will be surrounded if it is dipped into a vessel of water and quickly removed. This dissolves the plant food and the rootlets are able to run through the warm soil. The finer the soil is made the more particles there will be and therefore the more film water it will contain.

Here, again, humus plays an important part in holding water like a sponge. Take three jars of equal size with perforated bottoms. Fill one with gravel, one with clay, one with sand, and the fourth with decayed vegetable matter. Saturate them all with water. At the end of forty-eight hours nearly all the water will have escaped from the gravel, probably half from the clay and sand, but the jar containing the humus will have retained nearly all the water applied.

Pond Lillies and Reeds Growing on Saturated Soil

It is said, " water always runs down hill." This is not always true. Many tons of water rise in the soil as we have shown, and escape into the air. Take a lump of loaf sugar, place it in the bottom of a glass of water and see how quickly the water will rise to the top of the lump. If it could remain in that position long enough all of the water would be drawn from the glass. Place some loose powdered sugar on the top of the lump and no water will escape.

If the soil tubes are broken off by tillage and an inch or more of loose soil is left on the surface it will prevent the loss of water by evaporation as the fine sugar does on the lump. This means stirring the first two or three inches of the earth after a rain before it becomes crusted. Shading the soil also will prevent loss of water.

Thus we see that in order to have our plants and trees grow well we must have plenty of available plant food of the right kind. We must make the soil a pleasant home for plants by having it sweet, fine and free from lumps; warm, and with plenty of air and sunlight, holding quantities of film water but with no dead water.

TREES AND PLANTS FOR ORNAMENT AND UTILITY

DR. GEORGE G. ATWOOD

NATURE'S PRIMARY PURPOSE IN GROWING PLANTS — SEED BEARING

In passing through the country one can see trees, shrubs, plants and vines on all sides. Natural growths are not all alike. There is much diversity in the distribution of the different species; those growing on the lowlands are vastly different from those growing on dryer hillsides, and again those plants that thrive in rich, loamy soils make but poor growth — possibly none at all — on dry, sandy plains. This makes the point clear that trees and plants seem of themselves to seek environment where they can best receive proper food supply for their purpose. What is this purpose? Primarily to bear seed to perpetrate the species, the same function equally important to both vegetable and animal life.

The life of trees, plants and even grasses and "wild flowers" is kept on earth principally by seeds that are produced. This is true of the humble but beautiful annuals that grow, bloom and ripen seed all within a single season, and it is also true of the great "monarchs of the forest" — the oak, the pine, the maple — which grow for many years before they produce their first seeds. Some then continue to grow their seeds for many generations.

This much for nature's way of doing things — always generous. always munificent, quietly teaching its observers, ever opening new fields for thought, but never at once revealing all that can be learned in her great storehouses of knowledge.

ADAPTATION OF PLANTS TO VARIOUS PURPOSES

"Arbor Day" comes around annually. What portion of nature's plan can be adapted to our purposes?

If we are to plant trees, let us first consider the object to be attained. Do we want shade and ornament? We look over what nature has done. The stately elm with its long life, wide crown and its drooping branches, requires much room for development. Given this, we must insist that the soil conditions are not too dry, but, as in nature, moist and congenial.

SUITABLE SHADE AND ORNAMENTAL TREES

Observation teaches that there are several large species of trees that, in spite of adverse conditions, may be planted and thrive in such unfavorable places as paved streets in the cities. Suitable trees for avenue planting in cities are American Elm, Silver Maple, Norway Maple, Plane and a few others. If large holes are made at time of planting and suitable soil is used to permit the roots to have enough food and moisture these varieties will thrive.

The species named above may be used to advantage in lawns and in parkways where the variety may be very largely increased by the planting of such others as:

Large Elm Tree

Ash — American white.

Beech — American white, European purple, cut-leaf and weeping.

Birch — White and yellow, European cut-leaf and Youngs pendula.

Catalpa — Speciosa and Bungi.

Dogwood — Floridus.

Elm — American white, English and Camperdown.

Hickory.
Judas Tree or Red Bud.
Kentucky Coffee.
Larch — European and American.
Maple — Silver leaf, red, sugar, Norway, sycamore, and Japan varieties.
Oak — White, red and pin oaks.
Salisburia or Japan Maiden Hair.
Tulip — American.
Magnolia Acuminata and Chinese Varieties.
Virgelia Lutea or Yellow Wood.

Even this list could be largely increased.

The species suitable for planting on lowlands or near the water front are: beech, elm, maple and varieties of willow.

Evergreens worthy of attention are spruces in variety, hemlocks, pines in variety — particularly the American white pine — red and white cedars.

EFFECTIVE ARRANGEMENT

Trees with long naked bodies are not attractive if the trunks are crooked, and some of our best and beautiful trees are the low headed ones, even when branched from the ground.

Trees placed in the lawn or park must not be crowded; each unit should have room to grow and develop naturally on all sides. There is beauty in symmetry and this is hindered if trees are planted close to buildings or if crowded and overshaded.

Having arranged a planting of the larger types of trees, our best judgment must be drawn on still further when we study a scheme for hiding the corners, obscuring the walks and driveways by plantings of shrubbery. The fundamental idea is to "let your domain appear boundless."

ORNAMENTAL SHRUBS

Shrubs should be located in clumps and on borders — never, even in small lots, where a tree would be more effective. They cannot take the place of trees, but serve in color schemes with their varied foliage and useful flowers. Many shrubs thrive under partly shaded conditions if the soil is rich or well supplied with humus. Sufficient moisture is essential to best results, as the roots are not generally deep feeders. For this reason few shrubs thrive if planted near maples and elms which are also shallow rooted and are surface feeders. There are hundreds of good shrubs, among which the following are adapted to most adverse surroundings; here we have a wide choice of color of bloom, attractive foliage, hardiness and usefulness in landscape effects:

Well-cared-for Apple Tree

Althea — Rose of Sharon.
Cornus — Red twig dogwood.
Deutzia — Strong and dwarf varieties.
Forsythia — Golden bell.
Japan Quince — Flowering.
Prunus — Double flowering and purple leaf.
Halesia — Silver bell.
Hydrangea — Paniculata.
Lilac — Persian, Japan and common in a score of colors.

Philadelphus — Mock orange syringa and dwarf golden leaf.

Viburnum — In variety including Japan and common snowball.

Weigela — In variety of bloom and foliage.

Climbing vines are suitable for growing on arbors, trellises, and a few on or near houses. American Ivy or Virginia Creeper; Chinese Wistaria, blue or white; trumpet vines and honeysuckles all need support to grow upon. Boston or Japan Ivy will grow and sustain itself on stone or unpainted brick or stucco walls.

Of course our planting scheme is far from complete until the thousand and one attractive flowering annuals and perennials find a place in our collections. In this list we must have roses, dwarf and standard, climbers for the trellis, Wichuraiana, for rock work — early and late, fragrant and beautiful, " millions in June " and waxlike gems in late autumn.

Result of Thorough Spraying (Imperfect apples in small heap at left; product of tree in background)

EDIBLE NUTS

Attention is invited to the advantage of planting nut-bearing trees for the reason that they are very useful for ornamentation, equally so with many of our native trees, and they have the additional advantage of supplying nuts in their season. As a rule they are rather long in coming into bearing but the compensation of durability indicate that the planting should be made where they have an abundance of room to develop. Most of them are strong growers and live a long time. They grow on nearly all kinds of soils and conditions and require but little attention. The species suggested for planting are the shag-bark hickory,* the black walnut, butternut, American sweet chestnut** and beech nuts. Nut-bearing trees of smaller growth and which can be recommended are: Japan walnuts and English walnuts — the latter hardy wherever peach trees thrive — and the Japanese chestnuts which are dwarf in habit but very prolific.

FRUIT TREES

The same fundamental principles apply to fruit trees, vines and small fruit plants in relation to location and forms of planting as pertain to trees planted for shade and ornamentation, yet experience has shown that some additional factors enter into the problem.

Location for a fruit garden or a single tree should be the best attainable. It should be out in the broad sunlight, and plantings must not be crowded. Where possible, arrangements should be made for thorough cultivation, conservation of fertility and moisture. Varieties should be selected with great care, having in mind whether the fruits are intended for the family or for commercial purposes.†

The following are some varieties of apples and peaches of known commercial value:

APPLES

Lake Champlain District

Permanent	*Filler*
McIntosh	Alexander
Fameuse	Oldenberg
Greening	Wealthy
Northern Spy	

Hudson River District

Permanent	*Filler*
Baldwin	Alexander
Greening	Oldenberg
Fall Pippin	Wealthy
McIntosh	Rome
King	Sutton
	McIntosh
	King

---

* See Circular 64, Department of Agriculture.

** It is unwise to attempt to grow chestnuts in the lower Hudson valley, where disease is prevalent.

† See Circular 87, Department of Agriculture.

Schoharie-Catskill District

Permanent	*Filler*
McIntosh	Alexander
Esopus	Oldenberg
Greening	Wealthy
Baldwin	
Northern Spy	

Western New York

Permanent	*Filler*
Baldwin	Rome Beauty
Greening	Twenty Ounce
Northern Spy	Alexander
King	Oldenberg
	Wealthy

Southern Tier of Counties

Same as for Western New York

PEACHES

Varieties most tender in bud	*Varieties most tender in wood*
Early Crawford	Early Crawford
Late Crawford	Late Crawford
Niagara	Niagara
Chairs Choice	St. John
St. John	Chairs Choice
Fitzgerald	Elberta
Reeves Favorite	Carman
Globe	Champion
Carman	Smock
Crosby	Belle of Georgia
Champion	Greensboro
Smock	Crosby
Stevens Rareripe	Hills Chili
Belle of Georgia	Stevens Rareripe
Greensboro	
Hills Chili	
Salway	

Insect depredations and fungous diseases should be studied and modern methods applied to conserve the crops.*

The planting of trees and their care are worthy of our best endeavor. The subject is very broad and no field is so full of interest and no limitation is placed on the educational, artistic and practical aspects of this subject.

To illustrate: some of the most common and injurious insects of fruit trees are San José Scale, Codling Moth and Blister Mite, and of diseases, Apple Scab, which produces on the fruit a dark, unpleasant coating and often prevents its growing to full size. These can be controlled by spraying as follows. (The lime and sulphur in addition to destroying the San José Scale also prevents the spread of the apple scab.)

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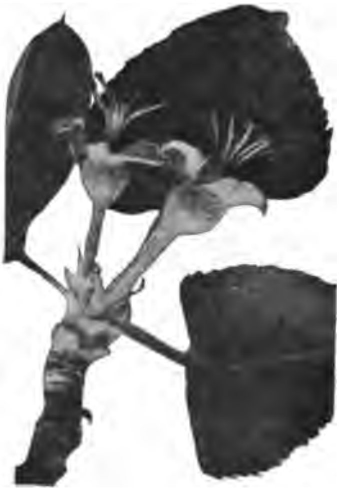
* See Circular 58 and Circular 112, Department of Agriculture.

SPRAY CALENDAR

1. First or dormant spray

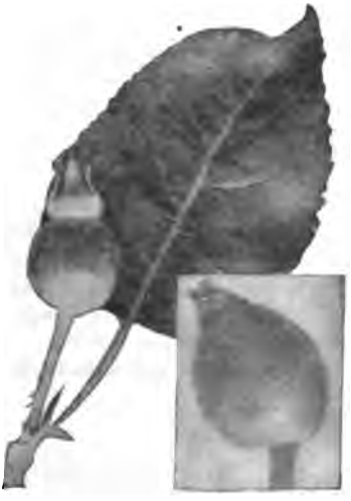
If for San José scale and blister mite apply lime-sulphur 30 degrees Beaumé, 1 to 8, before buds start in spring. If for San José scale and aphis add ¾ of a pint of tobacco extract (40 per cent. nicotine) to each 100 gallons of the above and apply when buds show green but before leaves begin to unfold. Four pounds of arsenate of lead can be added to each 100 gallons of this wash for case bearers, bud moths and tent caterpillars.



Proper Condition to Spray for Codling Moth

2. Second spray

If red bugs are seriously injurious, the most effective control measure is to spray with a 40 per cent. nicotine tobacco extract used at the rate of ¾ of a pint to 100 gallons of water or spray material. If water is used, 4 to 5 pounds of whale oil soap should be added to each 100 gallons. This should be applied before blossoms open but after leaves and blossom buds separate.



Too Late to Spray Effectively for Codling Moth

3. Third spray. Primarily for apple worm or codling moth

Just as the petals fall, beginning preferably when about two-thirds have dropped and certainly within 7 to 10 days of the dropping of the bloom. By far the most important spray for control of codling moth.

Arsenate of lead, 2½ pounds to 50 gallons; lime-sulphur wash 1 to 40. Add nicotine to this spray if plant-lice and red bugs are present in the orchard.

4. Fourth spray. Primarily for second brood of codling moth

Nine to ten weeks after the petals fall or the latter part of July or early in August.

Arsenate of lead, 2½ pounds to 50 gallons of water. Lime-sulphur wash, 1 to 40.

This last treatment is also effective in checking late summer leaf feeders.

All of these publications are free and will be sent, upon request, to any whose names are not already on our permanent mailing list.

In order that definite information might be carried away from the meeting the following new matter was placed on the back of programs; this in addition to facts published in this way in previous years and appearing in the reports:

NEW MATTER ON BACK OF PROGRAMS

INSECTS INJURIOUS TO FRUIT TREES

CODLING MOTH

This insect is largely responsible for "end-wormy" and "side-wormy" apples. To prevent injuries apply arsenate of lead, 3 pounds to 50 gallons of water or dilute lime-sulphur as soon as petals drop. Endeavor to wet all young fruits.

SCALE INSECTS

To control the San José scale apply in the spring before leaves appear 1 gallon of lime-sulphur solution testing 32° B. to 8 gallons of water. Use the liquid in liberal amounts and thoroughly spray all portions of the trees. The oyster-shell scale and scurfy scale are amenable to the same treatment.

EARLY APPEARING CATERPILLARS

Such species as casebearers, bud moth, green fruit-worms and leaf rollers are most effectively combated by spraying during the period when buds begin to swell and appear green at the tips, up to the time when the leaves are fairly out. One thorough application each year with arsenate of lead 2 to 3 pounds of poison to 50 gallons of water usually affords the desired protection. For fruit-tree leafroller, in addition to above, spray trees just before buds open with miscible oil diluted with 15 parts of water.

APPLE RED BUGS

These insects may be controlled by spraying just before the blossoms open and again after the petals fall with nicotine extract (40 per cent.), using 1 pint of the extract and 4 pounds of soap to each 100 gallons of water. These treatments coincide with the second and third applications that are regularly made for scab and codling moth, and fruit growers are advised to add the nicotine without the soap to the lime-sulphur and arsenate of lead. The presence of this insect in the orchard may be determined by placing dormant twigs of bearing wood in water in a warm room after March first, and if eggs of these insects are present, small, active red bugs will appear, which will attack the tender leaves.

PEAR PSYLLA

At a convenient time remove loose and rough bark from trunks and larger limbs to discourage the "flies" from wintering on trees and to render them more exposed to spraying mixtures. Bark is more easily detached following a wet period. Care should be taken not to cut into live tissues. The problem of psylla control is a comparatively simple one — to make a thorough "clean-up" of the adult "flies" just before they enter or just before they emerge from winter hibernation or to destroy the eggs and young larvae of the first brood while they are still on the branches, stems and fruit spurs or on unopened cluster buds. To kill winter "flies" apply nicotine extract (40 per cent. nicotine) ¾ pint, soap 3 to 5 pounds, water 50 gallons, during the late fall or early spring. To destroy eggs apply lime-sulphur solution, 1 to 8, as blossom cluster buds separate at the tips. See Geneva Popular Bulletin 387.

APPLE APHIS

Use soap, 6 to 8 pounds, to 50 gallons of water, or nicotine extract (40 per cent.) ¾ pint, soap 3 to 5 pounds, and water 100 gallons. The liquid should be applied under reasonably high pressure in an endeavor to wet all of the insects. Failures are chiefly due to the manner of spraying and the lateness of making the applications. Plant lice are most vulnerable to treatment when they are appearing on the green tips of buds or when leaves have unfolded but have not been curled by the insects. Nicotine extract without soap may be used with dilute lime-sulphur, thus avoiding the necessity of an extra spraying to combat the aphides alone.

ORCHARD FACTS

FERTILIZERS FOR FRUITS

Fruit growers may assume that trees do not need fertilizers if they are making a fair amount of growth. If the trees look dingy and unhappy, ascertain: first, if they are infected by disease or infested by insects; second, make sure that the orchard is well drained; third, if the trees are in sod, try thorough tillage and cover crops; fourth, use fertilizers after having obtained as much evidence as possible as to what fertilizer the trees most need. A hit and miss application of fertilizers is gambling pure and simple.

COVER CROPS

A combination cover crop is best. Vetch is taking the place of clover — 15 or 20 pounds of vetch and a bushel of oats or barley per acre is a good combination. A cover crop which turns back less than a ton or two of vegetable matter per acre is hardly worth the seed planted.

PRUNING

As a rule prune young trees only enough to shape the head. The peach is the only fruit that needs to be headed back as a regular practice. Prune old trees a little every year. Cherries are usually injured by pruning. Severe pruning is warranted only in sick or decrepit trees.

NEW VARIETIES

Speculation is the chief charm of new varieties and there are a few new sorts having more than speculative value. Most varieties of fruit are not adapted to a wide range of conditions. For commercial plantations, plant only standard sorts.

PLOWING ORCHARDS

Fall plowing is more and more practiced with orchard fruits, and on clay soils may well be recommended not only because of the greater convenience of doing the work in the fall, but because it is beneficial to the soil. In light soils early spring plowing is probably better.

CLOSE PLANTING

It is patent to the eye of every passerby that fruit growers are overcrowding fruit plantations. The greater production of single plants and outside rows teach the value of planting thinly.

STOCKS FOR CHERRIES

The superiority of Mazzard over Mahaleb as a stock for cherries is everywhere demonstrated. The latter dwarfs the tree, makes it short-lived and less productive. Cherries on Mahaleb are easier grown than on Mazzard and fruit growers should expect to pay more for varieties on Mazzard stock.

SOD AND TILLAGE

Apple trees in sod produce better colored apples than those tilled. Sod reduces the quantity of fruit, however. At the New York Agricultural Experiment Station for every dollar taken from a sodded orchard, $1.89 was taken from a tilled orchard of the same size.

CONTROL OF GRAPE TROUBLES

GRAPEVINE FLEA BEETLE, "STEELY BEETLE"

Collecting the adults into pans having a shallow layer of kerosene is as economical a method as spraying to kill them. If the weather is such that rains can be avoided for several days, spraying with a mixture consisting of 3 pounds of arsenate of lead, ½ gallon of cheap molasses and 50 gallons of water will kill many of the adults. All spray mixtures in which molasses is used are readily washed from the vines by rains, so the greatest care must be exercised not to apply them just previous to rains.

The larvae appear on the foliage in greatest numbers about June 15th of a normal year, although there is some variation in this respect. Spraying the foliage with the mixture just given when the larvae appear will control the pest.

GRAPE ROOT WORM

The adult beetles are of a reddish brown color. The first adults appear between June 20th and July 5th, depending on the season. The majority of the beetles appear about a week after the first beetles and for this reason spraying should be done about a week after the first beetles are seen. The eggs are laid, as a general rule, during the latter two-thirds of the month of July.

If the beetles are present in moderate numbers, spray the vines with arsenate of lead, 6 pounds in 100 gallons of bordeaux mixture. Make the first spraying about a week after the first beetles appear or a little earlier and follow this with a second spraying in a week or ten days. If the beetles are present in great numbers and there is no danger of rain for several days better results are secured by using a mixture of 1 gallon of molasses, 6 pounds of arsenate of lead and 100 gallons of water. This should be followed by a spraying of bordeaux mixture and arsenate of lead not more than a week later.

The grape root worm passes into the pupal stage about the 15th of June, and horse hoeing at this time will destroy many of the insects.

ROSE CHAFER

Spray when the beetles appear, using 4 pounds of arsenate of lead, 1 gallon of cheap molasses or 12 pounds of glucose and 50 gallons of water. The larvae of this insect feed on grass roots, usually in very light sandy soil.

GRAPE LEAF HOPPER

Small yellowish white bugs with wings when adult. Adult passes winter in rubbish and in fence rows. They appear as soon as leaves open, feeding upon the under side. Eggs are laid about June 15th. Spray with "Black Leaf 40," one part to 1600 parts of water, or with bordeaux mixture early in July. Spray under side of foliage thoroughly.

BLACK ROT

Spray with 4-4-50 bordeaux mixture, preferably before rainy periods, when the second and third leaf is forming. Again soon after the blossoms fall and later at intervals of ten days. Spray with high pressure and thoroughly cover fruit clusters and tips of vines. If late summer is wet, the above spraying should be followed by two more, using ammoniacal copper carbonate at interval of ten days.

POWDERY MILDEW

Spraying for black rot will control this fungus.

NECROSIS OR SIDE ARM DISEASE

Remove and burn all diseased portions, training new arms from the main stem to take their places. If the trunk of the vine is infected at the ground there is no cure and the plants should be dug and burned.

For further information see Circular No. 58, State Department of Agriculture, Albany, N. Y.

DAIRY FACTS

Average composition of cow's milk and milk products.

	Water	Total Solids	Fat	Casein	Albumen	Sugar	Ash
Average of 5500 American analyses	87.1	12.9	3.9	2.5	0.7	5.1	0.7
Average of cheese-factory milk for season	87.4	12.6	3.75	2.45	0.7	5.0	0.7
Butter	14.0	86.0	82.5	1.0	......	......	2.5
Cheddar cheese from whole-milk (green)	36.8	63.2	33.8	23.7	......	......	5.7
Skim-milk (separator)	90.3	9.7	0.1	2.75	0.8	5.25	0.8
Whey	93.4	6.6	0.35	0.1	0.75	4.8	0.6
Buttermilk	90.6	9.4	0.10	2.8	0.8	4.4	0.7

Relation of fat to casein in cow's milk.

Per cent. of fat in milk	Per cent. of casein in milk	Ratio of Fat : Casein
3.00	2.10	1 : 0.70
3.25	2.20	1 : 0.68
3.50	2.30	1 : 0.66
3.75	2.40	1 : 0.64
4.00	2.50	1 : 0.62
4.25	2.60	1 : 0.61
4.50	2.70	1 : 0.60
5.00	2.90	1 : 0.59

Pounds of milk required to a pound of butter and a pound of cheese:

Per cent of fat in milk	Pounds of milk for one pound of	
	Butter	Cheese (green)
3.00	28.5	12.05
3.25	26.3	11.25
3.50	24.4	10.60
3.75	22.8	9.95
4.00	21.4	9.45
4.25	20.1	8.95
4.50	19.0	8.50
4.75	18.0	8.10
5.00	17.1	7.75

INSECTS INJURIOUS TO FIELD CROPS

ARMY WORM

To stop advance of caterpillars, plow a deep furrow, with vertical edge next to field to be protected. As insects congregate in furrow, destroy them by crushing. Sow broadcast, late in afternoon, in infested areas of field crops this poisoned mash: paris green, 2½ pounds, bran 100 pounds, juice of 12 oranges, water 3½ gallons, thick molasses, 3½ gallons. Thoroughly mix bran and paris green and add water, molasses and fruit juice. Mash should be only wet enough to crumble in the hand. For lawns and crops not intended for fodder, apply arsenate of lead, 6 pounds to 50 gallons of water.

CUT WORMS

Fields subject to attacks by cut worms should be plowed and harrowed both in fall and early spring to keep land fallow. To destroy caterpillars attacking crops, apply poisoned mash as for army worm, or the following bait, which is more easily prepared: Mix 1 pound of paris green and 16 pounds of bran. Moisten with water in which a quart of salt has been dissolved for each 10 gallons. Mash should be only wet enough to crumble in the hand and should be distributed late in afternoon so that it will be moist when caterpillars feed at dusk. Distribute broadcast or apply in rows at frequent intervals with a seed drill. For protection of small plantings place a tablespoonful of bait near each plant.

GRASSHOPPERS

Plow deep late in fall and thoroughly harrow land frequented by grasshoppers for egg-laying. Destroy young hoppers along fences and roads or in weedy areas, neglected fields or in young orchards by applying an arsenical. In level pastures or fields of small grains or for any crop permitting the use of such a machine, collect young grasshoppers by means of hopper-dozer. A cheap and effective means of destroying the insects is baiting with a poisoned mash as given above for the army worm or cut worms.

CABBAGE APHIS

Immerse leaves of seedlings before transplanting in a preparation composed of 1 ounce soap dissolved in 1 gallon of water. Before appreciable numbers of leaves are curled spray cabbages with soap, 6 to 8 pounds in 50 gallons of water, or nicotine extract (40 per cent.) ¾ pint, soap 3 to 5 pounds, water 50 gallons. For more complete directions for spraying write for Circular No. 30 of the Geneva Experiment Station.

CABBAGE MAGGOT

For early cabbages apply tar pads to seedlings at the time of transplanting. To avoid injuries to seed-beds of late cabbage, erect frames and cover with cheese cloth when seedlings appear above ground.

MAKE YOUR WOODLOT A PAYING FARM CROP

1. Woodlot products are becoming more valuable every year. They may be the most valuable farm crop. Hemlock in 1890 was worth only $9 a thousand; now it is worth from $18 to $24 a thousand. Other woods show corresponding increase in value.

2. When you want fuel wood and post material, it pays to cut out the smaller and inferior trees. Let the better ones grow a little larger for poles, ties and saw logs. The railroads, telephone and electric light companies are paying better prices. Ties are worth from 60 to 85 cents apiece now, whereas ten years ago they brought only from 40 to 50 cents.

3. Do not sell your better trees for the first offer. Ash and hickory bring good prices as spoke, implement, machinery and general vehicle material. Fancy prices are paid for walnut, cherry, locust and sometimes for prime specimens of other trees. If you cannot get a good market in your nearest town, it will pay you to look further. The State College of Forestry at Syracuse has a complete list of wood users and the approximate prices they pay for the different local woods.

4. It may pay you to put in a portable sawmill if your woodlot needs a lot of cutting. They can be set up complete for $1,000 to $1,400. They can be run by four men, and lumber can be sawed out for from $3 to $3.50 per thousand.

5. If you have not a good supply of chestnut posts, it may pay you to put in a post treating plant. It costs only from $10 to $30 for a simple creosote plant; and treating, including cost of plant, costs only six to ten cents a post. Perishable posts like willow, poplar, beech, hemlock, etc., can be made to last as long as locust, cedar and chestnut. If you have a lot of fencing to put in, it will pay you and your neighbors to put in a small treating plant.

6. Creosote is the best preservative. It prevents decay best; it is cheap (10 to 15 cents a gallon) and will not readily wash out of the wood.

7. The following list shows you the actual average prices paid per thousand for all grades of wood (usually in rough lumber) delivered at the mill:

White oak	$46 25
Cherry	46 25
Hickory	43 03
Yellow poplar	40 47
Red oak	38 49
Ash	38 49
Birch	30 07
Chestnut	28 56
Elm	$28 37
White pine	27 70
Basswood	27 36
Sugar maple	27 07
White cedar	24 61
Spruce	21 31
Beech	20 54
Hemlock	19 82

8. The woodlot is one of the most important remaining sources of our timber supply. The farmers of this country hold one-third of the whole supply in their woodlots. New York is an important woodlot state.

STATE FAIR

The exhibit at the State Fair inaugurated last year was repeated. As indicated in the illustration, the quarters were much more ample than the previous year, the institute bureau proper having a booth in the center of the wing of the Liberal Arts Building. The cow testing association exhibit in charge of Messrs. Nicoll and Ennis was located in the corner opposite, in line with the farm bureau exhibit to which it is so closely allied. Located, as it was, away from other agricultural and institutional exhibits, there were not the throngs about the booth that there were a year ago. Nevertheless, the fact that the institute bureau has headquarters at the fair has become established, and to its booth gravitated those seeking specific information or literature on agricultural subjects, which the bureau dispenses. Others have found the booth a most acceptable place where they may express themselves as to the work in their localities.

The booth was in charge of Mr. W. F. McDonough, Assistant to the Director. Messrs. McPherson, Van Wagenen and Witter were each in attendance two days, the Director being present part of the time. All of these found their time fully occupied.

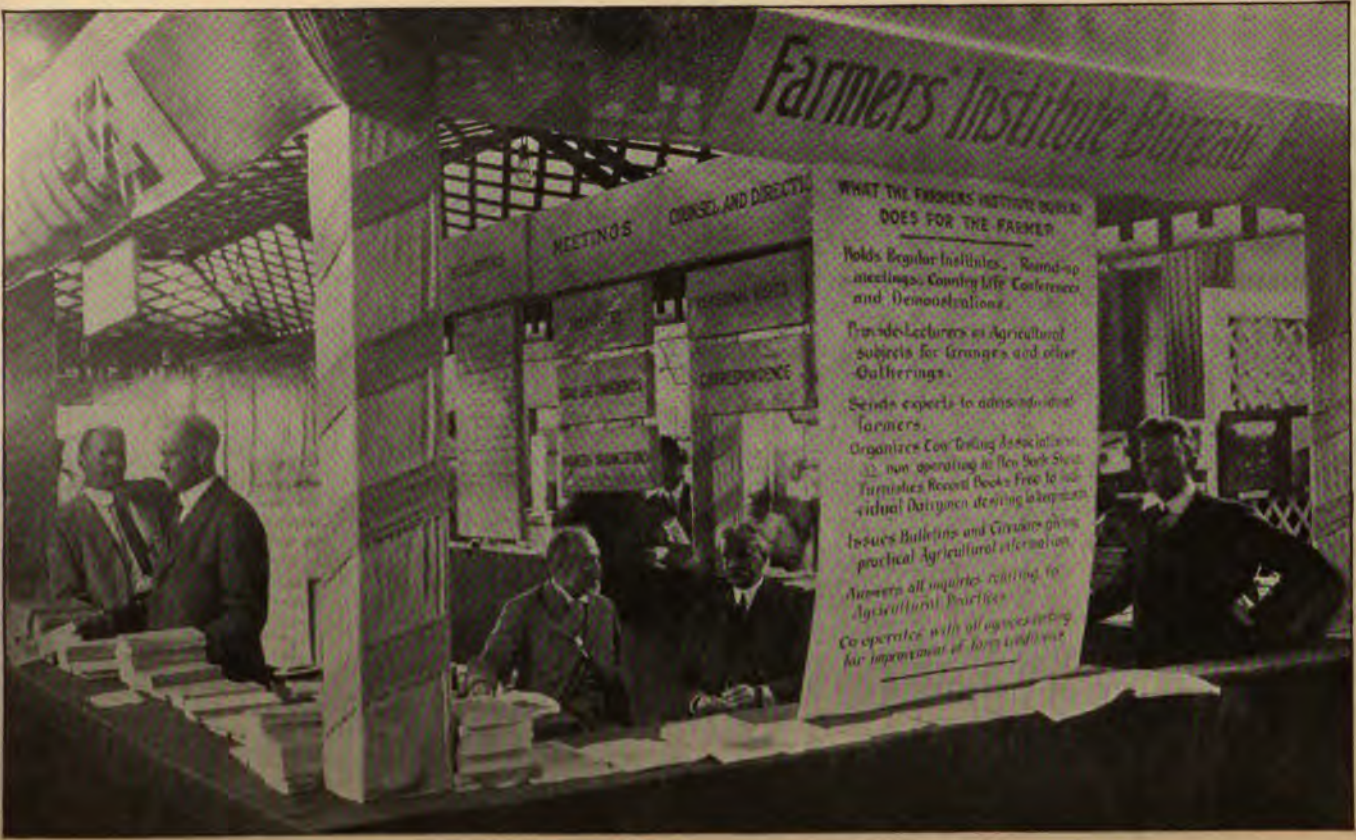

Farmers' Institute Bureau
MEETINGS
COUNSEL AND DIRECTI
CORRESPONDENCE
DOES FOR THE FARMER
Holds Regular Institutes, Round-up meetings, Country Life Conferences and Demonstrations.
Gatherings.
farmers.
Issues Bulletins and Circulars
practical Agricultural information

FIG. 499. BOOTH OF FARMERS' INSTITUTE BUREAU AT STATE FAIR, 1914

FARM BUREAUS

So intimate has been the relation between the farm bureaus and the Bureau of Farmers' Institutes that it was given a section in the Director's report a year ago, although there was no official relation between them. As noted in the introduction, the Director of Farmers' Institutes is now the official head of the farm bureaus as they relate to the Department of Agriculture and has been made a member of the committee composed of Dean B. T. Galloway and Professors G. F. Warren, J. L. Stone and A. R. Mann, State College of Agriculture, Ithaca, and Director of Farm Bureaus, M. C. Burritt, Ithaca, to pass on the credentials of aspirants for the position of farm bureau managers. This has brought the Director of Farmers' Institutes and the Director of Farm Bureaus in even more intimate relations than heretofore existed — to the advantage of the institutes, and it is hoped to the bureaus.

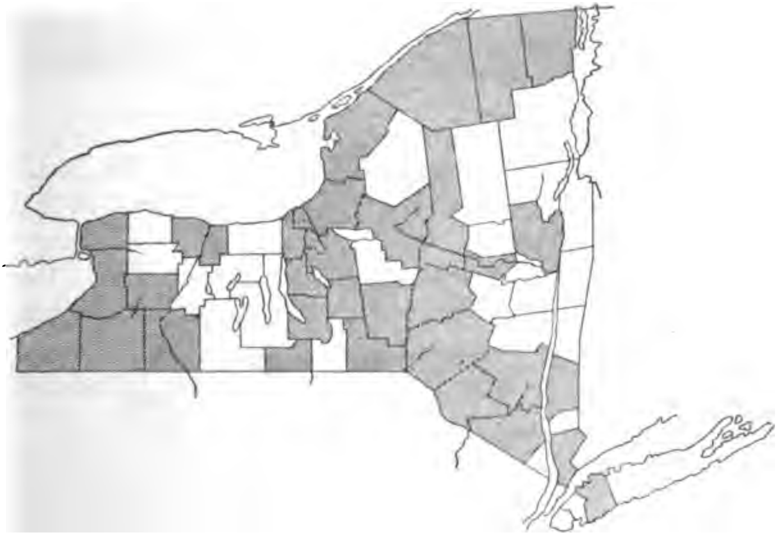


FIG. 500. THE DARKENED AREAS SHOW THE COUNTIES IN WHICH FARM BUREAUS HAVE BEEN ORGANIZED

All the bureau men have their expenses paid to, and are expected to attend the Normal Institute, where they partake in the discussion and receive the same instruction given to the institute workers. With one exception they assisted at the institutes in their respective counties, being a most vital factor in making the work applicable to the locality.

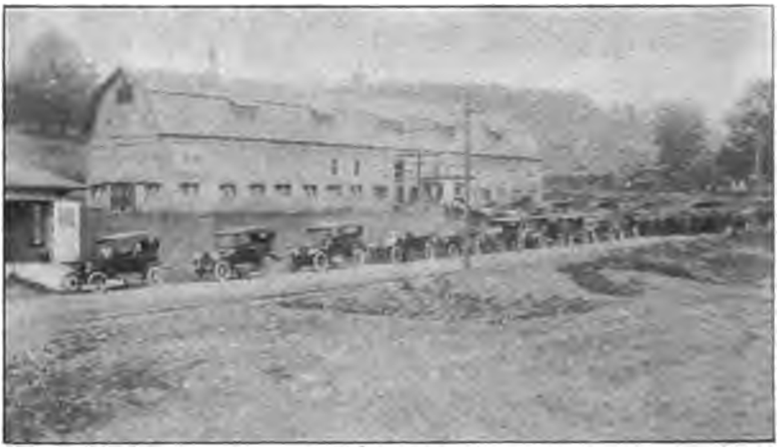


FIG. 501. FARM BUREAU INSPECTION TRIP, CORTLAND COUNTY

The county conferences are held in the bureau offices. During the past year, owing to the inability of the Director of Farmers'

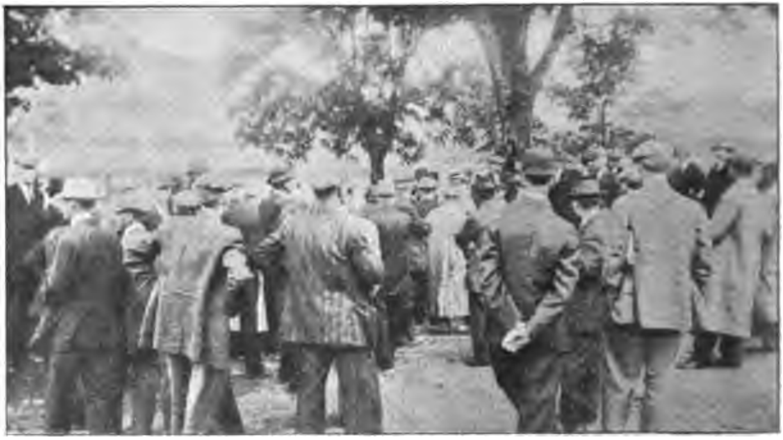


FIG. 502. LISTENING TO A TALK BY W. L. BEAN, McGRAW, N. Y. EVERY TOWN IN CORTLAND COUNTY REPRESENTED

Institutes to attend most of the conferences, ten were held by the bureau managers, who located the institutes and suggested the programs for their respective counties.

Whenever possible, assistance has been given the bureaus by the Director of Farmers' Institutes. All of the above indicates team work and adds to the effectiveness of both farm bureaus and farmers' institutes.

COMPLETE LIST OF ORGANIZED FARM BUREAUS IN NEW YORK STATE UP TO JUNE 14, 1915

County	Manager	Headquarters
Allegany	F. C. Smith	Wellsville.
Broome	E. R. Minns	Chamber of Commerce, Binghamton.
Cattaraugus	H. K. Crofoot	Olean.
Cayuga	J. R. Teall	Auburn.
Chautauqua	H. B. Rogers	Chautauqua.
Chemung	M. E. Chubbuck	Chamber of Commerce, Elmira.
Chenango	E. P. Smith	Norwich.
Clinton	C. B. Tillson	Plattsburg.
Cortland	E. H. Forristall	Cortland.
Delaware	T. M. Avery	Walton.
Dutchess	F. H. Lacy	25 Market street, Poughkeepsie.
Erie	W. L. Markham	Chamber of Commerce, Buffalo
Franklin	O. F. Ross	Malone.
Herkimer	C. A. Taylor	Herkimer.
Jefferson	F. E. Robertson	Watertown.
Monroe	L. A. Toan	Chamber of Commerce, Rochester.
Montgomery	A. S. Merchant	Canajoharie.
Nassau	L. R. Simons	Mineola.
Niagara	E. H. Anderson	Board of Trade, Lockport.
Oneida	G. W. Bush	Chamber of Commerce, Utica.
Onondaga	S. A. Martin	112 Court house, Syracuse.
Orange	T. E. Milliman	Goshen.
Oswego	E. V. Underwood	Oswego.
Otsego	F. S. Barlow	Board of Trade, Cooperstown.
St. Lawrence	C. S. Phelps	Canton.
Saratoga	A. M. Hollister	Saratoga Springs.
Sullivan	Jas. A. Richardson	Liberty.
Tompkins	V. B. Blatchley	Ithaca.
Ulster	W. H. Hook	Care Herbert Carl, Kingston.
Wyoming	H. M. Bowen	Perry.

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STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

CHARLES S. WILSON, Commissioner

Bulletin 74

Proceedings of

Farmers' Days Meeting

HELD AT

Albion, Orleans County

March 15, 16 and 17, 1915

In charge of Jared van Wagenen, Jr.

Correspondents — Orleans County, John Bidelman, Albion; Niagara County, E. J. McClew, Newfane; Niagara County, E. H. Anderson, Lockport; Monroe County, Lewis A. Toan, Rochester.

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PROGRAM

MONDAY: FERTILITY DAY — COURT HOUSE

9:00 A. M. REV. H. C. WOODS — Prayer.
DR. FRANK H. LATTIN — Address of Welcome.
MR. VAN WAGENEN — Response.
10:00 A. M. PROF. CROSS — The Makeup of Orleans County Soils.
10:45 A. M. DISCUSSION.
11:00 A. M. MR. VAN WAGENEN — The Place of Leguminous Plants as Soil Builders.
11:45 A. M. DISCUSSION.

1:30 P. M. ROUND TABLE.
2:00 P. M. PROF. AGEE — The Importance of Proper Crop Rotation.
2:45 P. M. DISCUSSION.
3:00 P. M. PROF. CROSS — The Place of Commercial Fertilizers in Economic Farming.
3:45 P. M. DISCUSSION.
4:00 P. M. PROF. AGEE — The Functions and Forms of Lime.
4:30 P. M. DISCUSSION.

7:30 P. M. MR. AKIN — The Horse Industry in Europe (Illustrated).
DR. DEXTER — Better Country Life.

TUESDAY: STOCK AND CROP DAY — COURT HOUSE

9:00 A. M. How to Select a Good Dairy Cow. Demonstration with Living Animals — DR. DEXTER.
10:00 A. M. MR. AKIN — The Horse for the New York State Farmer.
10:30 A. M. DISCUSSION.
10:45 A. M. DR. BRODHEAD — Horse Shoeing and Horse Dentistry.
11:20 A. M. DISCUSSION.
11:30 A. M. DR. VOLGENAU — Diseases of the Horse, and Hog Cholera.

1:00 P. M. The Horse's Feet and Teeth. Demonstration With Living Animals — DR. BRODHEAD.
1:45 P. M. ROUND TABLE.
2:15 P. M. PROF. WILKINSON — Crops for the Cannery.
2:45 P. M. DISCUSSION.
3:00 P. M. MR. VAN WAGENEN — Live Stock on the Fruit Farm.
3:45 P. M. DISCUSSION.
4:00 P. M. PROF. WILKINSON — Questions Pertaining to the Farm Garden Answered. (Printed question slips furnished.)

7:00 P. M. MR. TUTTLE — The Proposed Work of the Department of Foods and Markets.
MRS. MORGAN — Music and Song.

WEDNESDAY: HORTICULTURAL DAY — COURT HOUSE

9:30 A. M. MR. BENNETT — Fruit Conditions in the West.
10:15 A. M. DISCUSSION.
10:30 A. M. PROF. HEDRICK — Is There Danger of an Overproduction of Fruit?
11:10 A. M. DISCUSSION.
11:20 A. M. PROF. BARRUS — Diseases Likely to Demand the Fruit Grower's Attention the Coming Year.

1:30 P. M. ROUND TABLE.
2:00 P. M. PROF. PARROTT — Insects Likely to Demand the Fruit Grower's Attention the Coming Year.
2:45 P. M. DISCUSSION.
3:00 P. M. PROF. HEDRICK — Things to be Emphasized in Present Day Horticulture.
3:45 P. M. DISCUSSION.
4:00 P. M. MR. BURRITT — Intercropping the Young Orchard from an Economic Standpoint.
4:40 P. M. Closing Words.

TUESDAY: SPECIAL POULTRY SESSIONS — IN CHARGE OF DR. SANTEE

10 A. M.

DR. SANTEE — Opening Remarks.
MR. MOSELEY — Results of Last Year's Investigations at Cornell University.
DISCUSSION.
DR. SANTEE — Buildings and Apparatus.
DISCUSSION.

1:30 P. M.

QUESTION BOX.
MR. MOSELEY — Incubators and Brooders.
DISCUSSION.
DR. SANTEE — Marketing Eggs and Poultry.
DISCUSSION.

WEDNESDAY: SPECIAL WOMEN'S SESSIONS

10 A. M.

MRS. MORGAN — Words of Greeting.
MRS. HARRINGTON — Judging a Loaf of Bread (Demonstration).
DISCUSSION.
MRS. MORGAN — Some Things That Make Rural Homes Better.

1:30 P. M.

QUESTION BOX.
MRS. HARRINGTON — Recreation in the Home.
DISCUSSION.
MRS. MORGAN — The Power of Song.

SPEAKERS

E. S. **AKIN**, Syracuse,
Prominent Horse Breeder and Importer.

PROF. **ALVA AGEE**, New Brunswick, N. J.,
Director, Agricultural Extension, State College of Agriculture, New Jersey.

M. F. **BARRUS**, Ithaca,
Extension Professor, Plant Pathology, New York State College of Agriculture.

E. R. **BENNETT**, Ithaca,
Farmers' Institute Lecturer,

DR. C. W. **BRODHEAD**, Montrose, Pa.,
Farmers' Institute Lecturer.

M. C. **BURRITT**, Ithaca,
State Director of Farm Bureaus.

L. J. **CROSS**, Ithaca,
Professor of Chemistry, New York State College of Agriculture.

DR. WM. **HART DEXTER**, Washington, D. C.,
Bureau of Plant Industry, U. S. Department of Agriculture.
Farmers' Institute Lecturer.

MRS. IDA S. **HARRINGTON**, Albany,
Farmers' Institute Lecturer.

U. P. **HEDRICK**, Geneva,
Horticulturist, New York Agricultural Experiment Station.

MRS. ROSE **MORGAN**, New York City,
Farmers' Institute Lecturer.

R. S. **MOSELEY**, Ithaca,
Poultry Department, New York State College of Agriculture.

P. J. **PARROTT**, Ithaca,
Entomologist, New York Agricultural Experiment Station.

DR. E. M. **SANTEE**, Cortland,
Farmers' Institute Lecturer.

EZRA A. **TUTTLE**, New York City,
Deputy Commissioner, State Department of Foods and Markets

DR. E. L. VOLGENAU, Buffalo.
Veterinarian, and Farmers' Institute Lecturer.

JARED VAN WAGENEN, JR., LAWYERSVILLE,
Farmers' Institute Conductor and Lecturer.

A. E. WILKINSON, Ithaca,
Extension Instructor in Vegetable Gardening, New York State College of Agriculture.

FIRST SESSION

Monday, March 15, 9:45 a. m.

Mr. John Bidelman, the correspondent at Albion, called the meeting to order and introduced Rev. H. C. Woods, who offered prayer.

ADDRESS OF WELCOME

Dr. Frank H. Lattin, Gaines, N. Y.

In behalf of the farmers and fruit growers of Orleans county, and the citizens of Albion, it gives me great pleasure to welcome Farmers' Days and its staff of workers. Perhaps the attendance that these meetings will be accorded will speak far more eloquently than any word I can utter as to the warmth of the greetings extended to you today.

Orleans county, as we all know, is the garden spot of the Empire State, and I have known for a long time, through investigation and research, that it was the original God's country. While many may take exception to this assertion, I believe it is acknowledged that Orleans is the mother of them all. While it is noted for its quarries, its diversified farm interests, for its thousands of acres devoted to canning factory products and muck farming, it excels in the producing of orchard fruits, especially the apple. In the production of the apple, Orleans county excels that of any other county in the number of bearing trees, producing more barrels of apples per square mile than any other county in the world. At our State Fair, for a number of years, Orleans county has been awarded first honors. Among the commercial exhibits at the last State Fair it was awarded ninety per cent of the first prizes; also, it was largely the winner of plate exhibits in competition with Hudson river counties and Long Island, which far exceeded us in the maturity of fruits.

At last fall's exhibit at our own county fair we had 1,500 or more plates of apples alone on exhibition, exceeding, perhaps, that of most our state fairs throughout the country. Our county fruit growers' society is one of the largest (perhaps the largest county society) in our land, excelling in numbers and in enthusiasm that of most of our state societies.

I have just been told that at the Panama-Pacific Exposition the state of New York (which means Orleans county) has outdone every locality represented, even the noted Hood river valley in the state of Washington.

I have a few words to say to you on the ideal of that for which you have met here. As farmers and fruit growers, Nature has provided us with the golden key to one of her richest treasure chests. Let us practically demonstrate that the trust has not been misplaced. Let us imbue our sons with a like spirit and understanding — send them to Cornell for at least a short course in agriculture and horticulture; take them to the institutes and fruit growers' meetings and to the homes, the orchards and the vineyards of our most successful and up-to-date culturists. Inculcate in their minds the fact that the chief element of success or failure in solving all problems of the farmer and orchardist is the man. The man who attempts farm or orchard management or the marketing and distribution of the results by guesswork, or is too indolent or too busy to meet the essential features promptly and properly as they arise, would better let it alone, as failure is inevitable. To assure success, the man must not only know when, how and what to do, but must appreciate the fact that the way to do things is to do them.

In conclusion, I wish to state that we not only forecast but sincerely believe that if the farmers and fruit growers of Orleans county are wise they will plant more fruit trees, give the ones already started more and better care, renovate and reclaim their old farm orchards and give them a chance, and finally pick, pack, market and boost the resultant products in an up-to-date, business-like manner, so that in a decade or two hence the conditions in relation to the over-production problem will be such as to be unbelievable that it could have provoked serious discussion at these meetings.

We may not live to realize the benefits of our labors in full measure. Those who come after us will, and we feel that it is a duty we owe, not only to humanity but to our county also, to plan for the future and future generations.

RESPONSE

JARED VAN WAGENEN, JR., CONDUCTOR

My good friends, it is my very pleasant duty to say something in response to this address of welcome. I should like to say for one thing, that I feel, as an institute conductor, that the address of welcome should never be omitted. Some men say that it is perfunctory, and perhaps it is; nevertheless, I think the address of welcome is about the easiest way to "break the ice" (if you will allow that phrase) between a man and his audience.

I have never yet heard an address of welcome but what afforded a text. The thing I like best is the note of patriotism that rings through it, because we all ought to be good New Yorkers and good citizens. Dean Cook says, "I would not give very much for a man who would not stand up for his own state, his own country, his own farm, and his own family, even though he had to lie a little bit in doing it." A man who stands up for Orleans county does not have to lie, for it is a magnificent county. All the rest of the sixty-two counties of the state look with a feeling of admiration at this county, for really this famous Ontario shore is God's country.

Reference has been made to the wonderful development of horticulture here. Someone has said that there are more apple trees in the state of Missouri than in the state of New York, but that there are more apples grown in the county of Wayne than in the whole state of Missouri. We have just heard here this morning that the county of Orleans exceeds the county of Wayne in production.

Now, if we could learn to make a note of the patriotism which rang through that address this morning; if we could learn to believe that the skies over us are a little bluer and the grass a little greener; that the fruit is a little redder in October than in any other month — if we can get that vision of the country, I am sure that these other troubles will cease. This is the message that Dr. Lattin gave to us, and it is a message I should like to emphasize for you — a spirit of pride and patriotism for this beautiful country in which you dwell.

This special meeting is only one of five that we call "Farmers' Days." These few large and expensive meetings are held only in those localities in the state where Director van Alstyne feels they are justified, and particularly here because Albion has a long and creditable history, and because you have among your number one Mr. Bidelman, who has the honor of being the dean of the institute correspondents of the state of New York. Mr. Bidelman, I believe, has been the correspondent for the institute in Albion for twenty-six years, without a break. And we feel that the Farmers' Institute Bureau has a right to make special demands upon you, because of the fact that this big meeting is held here; it can be justified only if we have a large audience, and if we can feel that a meeting like this has been good in its effect — being equal, perhaps, to a dozen other similar meetings over the state.

Then, I want to call your attention to the fact that this program has been systematically worked out. Director van Alstyne has tried to avoid the usual somewhat "hit-and-miss" methods. You will note that today is Fertility Day, and that is right, because it is the first day of the meeting. Say what you will about all these other things — business methods, farming and the like — the great fundamental of all our agriculture, the one thing which we must have is farm fertility, and if we fail in that we fail in all the rest. I sometimes feel that it is the problem of agriculture which, in many cases, we have not as yet successfully answered. Understand, I am not a pessimist; I am not saying that our lands are any poorer. A man can look around in every community and see, here and there, a farm that is giving better products than in the past, and there are other farms where, as yet, the owner has never been wise enough, and thorough enough in his business, to understand his soil fertility. It is the one fundamental principle in agriculture, and it seems to me very wise to have it on the program for the first day.

Tomorrow will be Stock and Crop Day. There was an old Englishman who wrote books many centuries ago, and I remember one very famous phrase of his, saying that "the men and horses made it all and the men and horses ate it all."

Wednesday will be Horticultural Day, in which, of course, you are fundamentally interested. The growing of fruit is by far the greatest agricultural interest on this shore, and men all around are thinking of the wonderful work you are doing here. Professor Hedrick and Professor Parrott, and some others, will discuss the great problem of horticulture.

You will note also that the interests of the poultryman and homemaker have not been forgotten. If there is anything which, in the past, has been neglected, and about which in the future a great deal will be said, it is the question of the home. On Wednesday you will, above all, urge your wives and mothers, and sisters and sweethearts, to come to the meeting, because this woman's work, I think, has the greatest future of any work we are going to do in the state of New York.

I want to urge upon you the use of the round table and the discussion period. We are giving fifteen minutes for discussion of each subject. If there is anything that is demoralizing to a speaker it is to say that there will be fifteen minutes for discussion and then have no discussion. Bear in mind, please, that the men here officially from the state are not the only ones. My idea of an institute is that a few men should guide and have the people enter in with their discussion. You, yourselves, can really bring to this meeting an amount of useful information that cannot possibly be brought by a man from a distance.

Finally, one other matter: the evening sessions will not be of a technical nature; they will be for the family. The farmers' institute work in this state, under the guidance of Director van Alstyne (whom I love to honor), has more and more come to this, that it has to serve with everything that has to do with the farm itself. The farmer is more important than the farm, and must be first. I am always glad that the institute, to a great extent, is coming to say boldly that it is more important to improve the breed of men than the breed of horses.

I have the pleasure of introducing to you Professor Cross, of Cornell University, who will deal with "The Makeup of Orleans County Soils."

THE MAKE-UP OF ORLEANS COUNTY SOILS

L. J. CROSS

Professor of Chemistry, College of Agriculture, Ithaca, N. Y.

I was reared in Wayne county, where we have local pride and patriotism, but we have had to recognize and take off our hats to Orleans county. In some respects you are better favored in Orleans county than we are in Wayne. It is true that we both have the lake at the feet of our colonies, but the soils are somewhat different. In this county, probably you know that the soil might be divided, horticulturally, into two great sections; that is, the north and the south. Between the northern and southern parts we have the intermediate section, so we might make three regions. The strata of these three regions is different in Wayne county, especially in the eastern part, than it is in this county, and it is fortunate that you have in this county so much of what we call Dunkirk loam.

A loam consists of clay and sand and silica, without a predominance of any particular one. If we have an abundance of clay we call it a clay soil; if sand predominates we say that we have a sandy soil; and if we have considerable clay, sand and silt, then we have what we call a loam, which is considered the freest and one of the best soils for fruits, especially the apple. It is said that the apples grown on the Dunkirk loam have better color, better flavor and better keeping qualities than the apples grown on the other soils in your county. That may be true, and probably is, but it does not mean that we cannot grow good apples on other soils. The people of Rensselaer county, in producing their apples, might dispute the fact that your apples have better color and better flavor and better keeping qualities.

In Wayne county, from boyhood up, we have regarded the counties of Niagara and Orleans as at the top of the list in fruit production. I shall see if I can outline to you something of the make-up of the soils of this county. Let us make this Falls Road the dividing line. There has been no systematic soil survey, but

Ontario county and Monroe county and the regions around here have been surveyed, and the geology of all this section is the same. While we have different soils, which give rise to different types of crops, in a general way these counties of Niagara and Orleans and western Monroe are somewhat of the same nature. So I cannot talk to you specifically of certain districts of your county, or certain portions, but I can talk about the county in a general way.

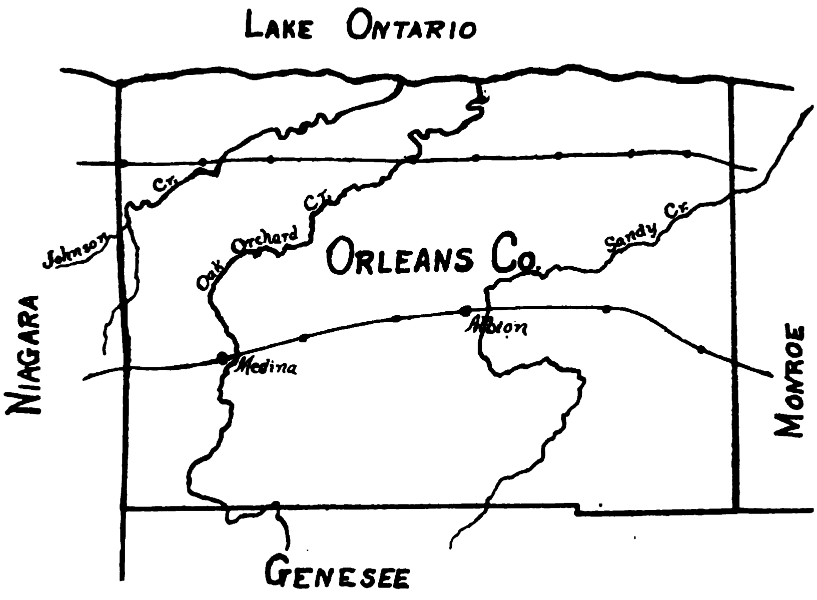

FIG. 503. MAP OF ORLEANS COUNTY, SHOWING TWO LINES OF RAILROADS AND PRINCIPAL STREAMS.

I think it is the practice, throughout this county, not to put the best apples on the heavier lands that you have to the south; still you may find people growing apples there successfully. Much depends upon the treatment of heavy soil, and so my statements are general. In the southern part of the county are shales and limestones. Just south of the railroad, and following it very uniformly, is a strip which consists of sandstone and limestone. North of the railroad we have the Ontario plain, which consists of sandstone, and south of the railroad is a narrow strip which we might call the intermediate area, where we may find limestone and a little shale. So we have the heavier soils in the southern part, and to the north we have the lighter sandy loams that have been made from the sandstone. As you go north from the railroad here, you will find that the soils get a little lighter. Then we have had the influence of the wind and the wave action, etc. The elements have formed the soils for us. All the soils of this county are of glacial lake influence, and we expect them to have the characteristics of the soils deposited in the bottoms of our glacial lakes.

Now, as to the crops that are raised upon these different soils. Farmers in this county, as in the adjoining counties, have adapted the crops to the soil. My remarks upon this point will be of more interest to the man just starting out on the farm, or who was not born or raised a farmer in this county. If there is any city farmer here he should look to his neighbors and watch their operations from year to year. Here is his school of agriculture.

We find in the southern part that the heavier soils are adapted to the growing of good grain, and to general farming. In the north, on the sandy loams, we find that such crops as peaches, berries and other small bush fruits, thrive well. In the intermediate section between the sandy loams on the north and the heavier soils on the south, we find that pears and quinces grow well. Apples do not grow so well on the heavier soil. We prefer, possibly, a good loam for the apple soil, and I think where the best orchards are in this county you will find such soils. Next would be the loams containing more sand, and finally we may find some apples being produced on the gravelly, sandy loams. Cherry trees do very well on the gravelly, sandy loam.

These are the best adaptations. We have such in Orleans, Monroe and Wayne counties. You will not find in Wayne county the peaches that you find here, because there we have the heavier soils coming nearer the lake. This Dunkirk loam, and the sandy loam which you have, that are so good for growing peaches and bush crops, is your fortune. You have, scattered throughout the county, some muck lands, and muck lands are well adapted to special crops like lettuce, celery, onions, etc.*

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* Send to Department of Agriculture, Albany, N. Y., for copy of Bulletin 70, "The Vegetable Industry in New York," including articles on growing vegetables on muck land.

We could divide the soil of this county, making a simple classification, into two types — the Dunkirk type, which will include all the light-colored soil; and the Clyde type, which includes the dark soil. The Dunkirk soil was laid down under good conditions and the Clyde soils were laid down under swampy conditions. So the Clyde soils will contain considerable organic matter.

The farmer should not stand for any statement that his soils are good enough as they are. If at any time he thinks that he has brought the farm up to the proper state of fertility and it is producing well, he cannot stop there, thinking it will remain so; he must keep up that fertility. Some city men have bought farms in your region, or in the counties near you, which were at the top of the productive list — in excellent condition. They thought they would remain so. What have some of you people in this section done? Sold out at high prices and gone down to the east — down in Cayuga county and the western part of Oswego county — taken the soil there and are building it up. You expect to grow good apples, too. So, when any man comes to me for information as to what he is going to do up in Orleans county, I cannot do any better than to refer to some man here. People here know how to do this, and people down in Cayuga county and Oswego county are taking lessons from these fruit growers who have started on their farms.

What are the needs of these different types of soils? In the southern part of the county, where we have the limestones, we should not expect to need lime upon the soils. Its application may be necessary, however, because sometimes that limestone may lie deep; or, even if it is near the surface, unless mixed well with the soil which we cultivate, the tendency of lime is downward, and the lime is lost. It may also be over rock that does not contain enough calcium carbonate, and clay may be mixed with it. Generally, in the southern part of the county the lime question is not so important; but in probably two-thirds of the section north of this railroad if one contemplates growing certain crops that are sensitive to acid conditions of the soil, he will find that lime will be needed.

All of the soils of the light-colored types need drainage. Soils of the dark-colored type — the Clyde type — need drainage, even more than the light-colored ones. In many cases I am told that the farmers do not plow deep enough, especially on the heavier soils in the southern part of the county. This has no bearing on the soils in the northern part, the lighter soils. If the farmer in the southern part of the county is plowing three or four inches deep, it would be well if he increased one-half inch deeper each year until he reaches seven or eight inches. It looks reasonable that if he plows deeper on those heavier soils he will get more plant food. Of course you know the disadvantage of plowing deep on lighter soils.

I am told that some farmers on the heavy soils of the county, and in northern Ontario, have not yet learned that the use of the roller on this heavy clay soil is unwise. While the clay is wet you will find them using the roller and packing it down. Some of those farmers would be excellent men to work in the cement business — good men to lay sidewalks; but they have no business packing down this heavy soil.

Both the light-colored soils and the heavier ones need organic matter. The lighter soils must have organic matter in order to conserve the moisture, and the heavy soils must have it in order that the clay may be loosened up and worked more easily, and be drained properly. Our lighter soils are free and open and admit plenty of air, and they are going to lose plant food and moisture unless there is something to hold it. Our heavy clays exclude the air, and if we are going to have profitable crop production we must put them in condition to admit the air. You have countless numbers of employees working for you for nothing, if you give them the proper environment. I refer to the bacteria that are working in the soil, without which you cannot expect to produce any kind of a plant. They are working there night and day, and if you exclude the air from them they are going to die. If you give them little food, and a poor environment, they are going to strike. And they should. When you can get help for nothing just by giving them a good place to live, you ought to be willing to do that. They are earning money for you. You are paying for nitrogen in fertilizer to apply to your soil, and you might just as well have these little workers manufacture the soil for you.

Our muck lands need drainage. You probably have several plots here in the county that have not been reclaimed — have not been opened to cultivation. Do not make the mistake, when draining those muck lands, to over-drain them, because muck is porous. If you provide an efficient drainage system the water will be drawn away very quickly. I know of one large enterprise where they have drained a large area, and drained it so efficiently that it is going to give them trouble. They have no good inlet of water and have to depend upon the water that falls upon it. I doubt if that muck is worth much of anything under those conditions.

If we are going into the drainage problem we must study the type of the soil, and if we are going into the fertilizer problem we must study the type of soil — how they compare with each other, and the plant food they furnish.

The lighter loams north of here are deficient in organic matter, and usually they are deficient in potash and phosphorus. If you are going to add any of these three, supply the soil with organic matter first. When you get through putting on stable manure and decide you will not raise any clover or cover crop, you must make up your mind that you are falling from grace. In any section where they have depended upon commercial fertilizers and have allowed the organic matter to decline in the soil, they have finally had trouble; they have struck hard. Parts of Long Island have been struck, and it has given them a bad jounce — so bad that they have gone to some of the older farmers upon the Island and asked for advice. And what do you suppose those older men told them? "You will have to go back to the customs of your fathers, and provide organic matter in manure or green crops." You must do it.

In our special lines of farming we have gotten away from some of the good old orthodox principles. Those principles are solid; they will live just as long as any farmer trods the soil. We must have plenty of organic matter in our soils. My grandfather was a good Baptist deacon, and one of the most charitable men in his town; and yet you might call him stingy, because he would not give a poor man straw enough to fill a bed, unless the old straw of the bed was emptied in his barnyard. That idea was strongly fixed in the minds of those old farmers — not to sell any roughage off the farm. They lived up to it, and where farms were rented or let on shares the contract read that no forage should be sold from the farm. With our more modern ideas we have had to produce special crops, and have not been able to put that all back. In the eastern part of the state they sell straw, and we have sold hay. I have no objection to that. But if you took something from my soil I should expect you to pay it back, and if you do not pay your debts to the soil, you must expect to become bankrupt.

You know all the different advantages of organic matter, and the furnishing of organic matter to your soils is probably the great problem here in the fruit-growing section north of this railroad. We should not see the fine peaches that we do in Orleans county unless you were in some way getting organic matter into the soil. I suppose here, if you have not farm manure, you are using some cover crops and getting some organic matter from them. In our loams here to the north we should expect to put on potash and some phosphoric acid. Try to get away from the buying of nitrogen if possible. The clay soils south of us usually contain sufficient potash; that is, they are richer in potash than in the other foods. They are often deficient in lime and in phosphate. And so upon those soils we will find phosphoric acid used, and in some cases lime. The muck lands, which are easily worked after being reclaimed, and which furnish sufficient plant food excellent for the special crops, are often deficient in potash and phosphoric acid. These will have to be supplied in some way — maybe not at first, but after a time. So if you are growing special crops you may have to use from 1,000 to 1,500 pounds of a fertilizer having considerable potash and phosphoric acid. You will not find anything better than wood ashes, but they are usually too costly. Considerable nitrate will have to be applied to these muck lands when producing a quick-growing crop. If growing a crop that has a longer time to mature, it is not necessary to fertilize so intensively.

The general crops — hay, grain and potatoes — will thrive on muck, but the best results are not obtained on such soil. The sandy loams in your county produce the best potatoes. The light. sandy loams are excellent for the bush crops. We find that in some regions the sand is so light that the crop production is small. We have some such land down in Wayne county. But you would be surprised at the results on those soils with the bush crops when plenty of organic matter is supplied. Last year I saw picked a crop of the nicest raspberries that I ever looked upon, and they were grown upon what was considered one of the poorest soils in that neighborhood. This is a credit to the city man. He bought the place and the first thing he did was to purchase a quantity of manure and cover the soil with it.

The one thing we must procure in some way is organic matter. It is a big problem, and differs with the various farm conditions. It may be more economical for some to get it by manure, others by cover crops.

The soils of Orleans county group themselves into three main divisions. You probably have, in this county, seventeen to twenty different types of soil, and we classify them into the three divisions — the Dunkirk loam north of the railroad, the clays to the south, and the predominance of the sandy loam in the north. Upon these soils you are producing crops that could not be produced (especially fruit crops) if it were not for your favorable climatic conditions. Very often people who are trying to learn from you are studying only the type of soil, and they are studying your practices; but they have not paid any attention to your climatic conditions, and that is where they fail. You have very favorable weather conditions, since Lake Ontario is from ten to fifteen degrees warmer in winter, and ten to fifteen degrees cooler in summer, than it is over the land. So if you are called upon to instruct a man in fruit growing in some other section, the first thing that you must find out is the climatic conditions. You are fortunate in this respect, and with these types of soil you are highly favored. We should expect nothing else from your progressive farmers but that Orleans would be one of the greatest counties in the world for apples.

MR. VAN WAGENEN: We have fifteen minutes for discussion, and that time should be used in bringing out all we can which has to do with the fundamental problems. It is your workshop; it is your laboratory; it is your special stock in trade, and we should like to hear something from you.

DISCUSSION

QUESTION: For muck land, what would you recommend first?

PROFESSOR CROSS: Drainage first, lime second, then plenty of cultivating; and, under the conditions you have in this county, with abundant rainfall and a very high average temperature, success cannot help but come to you. In improving muck lands drainage is the first thing, because without it one cannot have bacterial action in the soil. One farmer told me that he could raise good crops without cultivation. I asked him how he did it and he said he used plenty of fertilizer. I should like to know what kind of a crop he would raise if he cultivated.

QUESTION: In the central part of the county, how close together would you advise placing the ditches?

PROFESSOR CROSS: It all depends upon the amount of water you have. I could not tell you. Those are problems by themselves, and a man should be on the ground before he answered that question.

QUESTION: What would you advise as a cover crop? We have tried several things. We find rye very good.

PROFESSOR CROSS: Rye is good and so is buckwheat, as you have gained something by their use. If you raise a crop of buckwheat or rye that goes back upon the soil, what do you gain? You have given back to the soil that which you took; the same elements that it took to grow that rye are going back, and you have gained this much, the organic matter, which in its decay helps to liberate locked-up plant food.

QUESTION: How is vetch?

PROFESSOR CROSS: Very good, one objection being the high cost of seed.

QUESTION: How is rape?

PROFESSOR CROSS: Rape is good. We consider it better than a good crop of buckwheat or rye. But if you use clover, alfalfa, vetch, peas or beans, all of which are nitrogen gatherers, those little workers in the roots are taking the nitrogen from the air and locating it in the soil.

QUESTION: How is red clover?

PROFESSOR CROSS: Red clover is the stand-by. It is the best fertility crop that a farmer ever raises on his farm. Alfalfa is better, but in many sections has to be nourished; one has to be more particular with it. Clover will grow on soils where alfalfa will not do well unless certain practices are carried out. Stations in Ohio are telling farmers that, if they can grow alfalfa, to do it; and if not, to do the next best thing — grow clover, then vetch. What would you grow if you did not grow vetch? Someone says beans. Yes; but I want something that will give more nitrogen than beans. On the very poorest soils we may get sweet clover to grow. Start away down at the lowest — sweet clover, vetch, alfalfa.

QUESTION: Would you grow sweet clover on an orchard?

PROFESSOR CROSS: That is a special problem. I prefer the clover to rye or buckwheat on many soils.

QUESTION: I notice a great many farmers in this section grow large crops of wild carrot? Is that a cover crop?

PROFESSOR CROSS: Some farmers will tell you that wild carrot does not do any damage. But it is only reasonable to suppose that the root must draw a great deal from the soil.

VOICE: Aside from red clover, peas and oats are the only things I have plowed under.

PROFESSOR CROSS: In Wayne county the farmers have an object lesson as to the effect of peas, and they do not see it; if they do, they do not profit by it. After corn they sow oats in the spring, and in the corner of the oat field there will be a little patch of peas for family use. In the fall they put in winter wheat. Go by that field in May, and you will see that wheat above the other. You need not know where the pea patch had been the previous year, you can find it.

VOICE: In some of our clay soils we dig down two feet or more and find white spots of a gritty nature. Would that indicate that lime is present?

PROFESSOR CROSS: In some places we have the marl underlying the clays, but in the majority of cases in this region it is sand. A little muriatic acid will tell you about that; if it is lime, it will effervesce.

QUESTION: Are weeds of any advantage whatever?

PROFESSOR CROSS: If you cannot grow anything else on a field you may get some advantage from growing weeds. Let weeds grow if you cannot grow anything else. What are all our domesticated grains? Nothing but weeds, improved. Why do weed seeds have greater vitality than our domesticated seeds? Because it is Nature's plan to put the vitality in those weeds so that when the land is bare she can conserve it. It is Nature's plan to conserve fertility.

Of what particular significance is this to us? In past years we did summer plowing. Did we get good results? Yes. We were liberating and making available considerable nitrates. The plants were fed better and had better growth, but we were losing a great deal. We were getting results at considerable expense, and after a time the loss was so great that we had to stop. Potash is fixed in the soil, but nitrates are not. That is Nature's plan. If it is in an orchard your trees are taking up the plant food. A field with nothing on it should not lie bare through the warm summer.

QUESTION: Is there any loss in the winter?

PROFESSOR CROSS: Slight loss in the winter. Nitrification goes on very slowly in the winter and there is but very little loss, and very often the freezing action tends to bring the soil into a better physical condition.

THE PLACE OF LEGUMINOUS PLANTS AS SOIL BUILDERS

JARED VAN WAGENEN, JR., LAWYERSVILLE, N. Y.

Farmers' Institute Lecturer

I am to say something to you about the place of leguminous plants in soil improvement. I shall make that a little bit broader—to some extent, a discussion of cover crops. What has been said during the last fifteen minutes has really led up to the problem.

The more we study the question of soil improvement the more stress we are laying on cover crops. I am not a fruit grower but a dairyman, and we have been brought up to believe that the royal way to soil improvement is the cow. Dean Cook has said that in New York State we are keeping dairies for the manure they make, and that the milk happens to be the by-product. And that is largely true. As a dairyman, I say that, while we trust mainly to the cow for fertility, nevertheless I am convinced that we ought to lay a little more stress upon the cover crop proposition. I shall, in the first place, speak of this from the standpoint of leguminous plants.

LEGUMINOUS CROPS ESSENTIAL TO PROFITABLE AGRICULTURE

If you should ask what was the greatest discovery in agriculture for one hundred years, it would not be the mowing machine or the reaper or the binder or the cream separator, or any of those things which we set up as the great epoch-marking inventions in agriculture. I believe it would be the fact that there is a class of plants called legumes. They are the clover, the vetch, the bean and the pea, and a large number of wild plants scattered over our fields that we never learn to recognize, but which have a wonderful nitrogen gathering power.

I am told that in the ancient land of Egypt, some thousands years ago, as shown by leases which have been discovered, tenants were forbidden to cultivate land in such a way that they failed to bring up a leguminous crop every three years. Men have known for centuries that after a crop of clover a good crop of wheat follows.

You have been growing good crops here from the beginning. Bear in mind, if you will, that you are in a comparatively new country. You may go down in the Hudson River valley and you will find that the land there was farmed a hundred and fifty years before this country was settled. So your problems are newer than ours. The problem of soil humus has not come home to you yet as to these older farms. But I am sure that for the one hundred years that you have been growing wheat and clover, your grandfathers recognized the fact that after a good crop of clover a good crop of wheat followed as a matter of course.

SCIENCE EXPLAINS KNOWN FACTS

Yet, after all, it is but a little more than thirty years ago that the scientific man dug out the reasons why these things are so. The general facts have been known for a long time, but their real explanation is more recent. I should like to quote here what

Professor Henry of Wisconsin has said: "The scientific man has followed along behind and has explained why these things are so. In any proposition where a large number of farmers are united it would be rash for a scientific man to scorn their ideas." So, the scientific man has not established the value of leguminous crops, but has explained why these things are so.

As farmers, we must always be interested in plant food. Our eternal complaint has been that soils do not contain enough of it yet. One of the hardest things to find is a soil that is literally free from soil food. In carrying on experiments men have grown plants in spun glass, or in sea sands boiled in strong acids. The reason for so doing is this: When one takes up the exact scientific method of investigating the growth of plants, he does not want his work confused by a soil that contains plant food to begin with. Men have grown plants in sand and have added the different elements of plant food, carefully weighing the exact amounts, and in that way have sought to trace out the different plant foods required.

NITROGEN FROM THE AIR

I shall outline to you, very briefly, just how this question of humus plants and soil inoculation is worked out. You may take any kind of seed and plant it in a soil of this character which is absolutely destitute of plant food. That seed will germinate and grow, and will send up a sprout, just on account of the plant food which is stored in the seeds. Garden seeds, for example, planted in that way will make an astonishing growth.

The experimenters took peas and supplied lime, phosphorus and all the other elements. The plant made a little growth and died — the supply of nitrogen was exhausted. Then a man made a wonderful discovery. He went into a garden where garden peas had been grown successfully, and shook up a handful of soil in a little distilled water and applied this to one of the plants, as a result of which this one plant made a better growth than the other plants. The answer is simply this: He had, thereby, inoculated that soil with the germs which enabled the plant to draw nitrogen from the air. The other plant simply grew until it used up the nitrogen which was stored in the seed; there were no nodules on the roots. On the other hand, by the application of water, he got certain little tubercles, under the general title of root tubercles, which we recognize as inoculation. The man who first worked that out, it seems to me, made the greatest scientific discovery of the century, so far as agriculture is concerned.

I find it hard to overemphasize the importance of this matter. Nitrogen is the most expensive element we ever buy, so far as plant food is concerned. If one buys very skillfully he has to pay fifteen cents a pound for it, and the way fertilizers are bought in this country, nitrogen costs twenty-five cents more often than fifteen. And yet it is one of the most potent things in nature.

Remember that on every square inch of the world's surface there are something like eleven pounds of nitrogen. In other words, we are bathed in nitrogen on all sides. A plant oftentimes grows yellow and dies for the lack of nitrogen. I think of those stories where men have perished on the ocean from thirst, simply because they could not get fresh water. It is so with plants; they are surrounded with nitrogen on every side, and yet most of them seem to have no power of using the free nitrogen in the air. They can use it in combined form very readily. If the nitrogen is united with hydrogen and becomes ammonia, they can use it. They can use nitrates, but they cannot use the free nitrogen in the air.

ROOT BACTERIA

The wonderful part of it is that there are certain classes of very low organisms, to which we apply that very familiar name of bacteria, which find a living place and a hold upon the roots of our leguminous plants. These organisms have a power which is not understood very well. They have a mysterious association whereby they enable plants to make use of the free nitrogen which is in the air — to what extent is hard to say. One of the most difficult problems in agriculture is to determine how much nitrogen is stored up in a crop of clover. You may excavate it, wash out the roots, and a chemist may tell you how much nitrogen there is in it. But you cannot tell how much of this nitrogen actually came from the air and how much of it came from nitrogen already stored in the soil. Never get the impression that leguminous plants get all the nitrogen from the air; that is not true. They obtain some from the soil.

INOCULATION

This brings us up to the question of inoculation. "Inoculation" has been a very catchy word. It has, unfortunately, been rather unfairly exploited by certain commercial people. It is my belief that the best form of inoculation is the actual application of soils from a field where a certain crop has already been successfully grown; and where men can go and dig up the roots, wash them off in water, and actually demonstrate the presence of nodules on the roots. It seems to me there can be no question whatever but that 200 or 300 pounds of soil of that nature is the most satisfactory form of inoculation there is. Commercial cultures are very much cheaper and they involve no risk of the importation of weed seeds. For instance, this morning the question of wild carrots came up. I might say that we have kept them off at home. If I had no wild carrots I should hesitate before bringing in bacteria, for I might, at the same time bring along some wild carrot seeds.

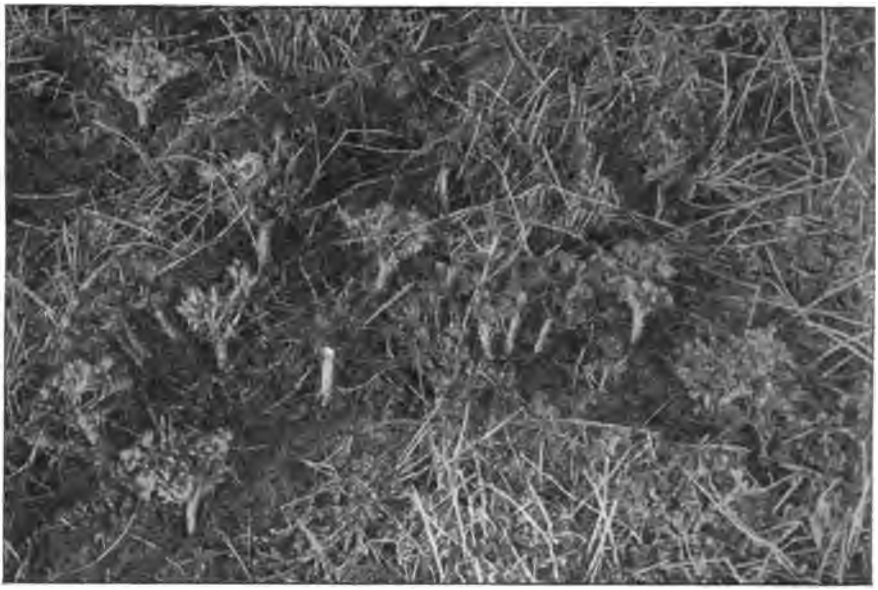

FIG. 504. CLOVER STUBBLE, SHOWING CROWNS AND ROOTS OF PLANTS THAT MAY PRODUCE HUMUS WHEN PLOWED UNDER.

However, we are not justified today in making any wholesale indictment of commercial cultures, because unquestionably some of them will do the work and are honestly put up. At the same time there have been commercial cultures sold that were failures. Some have been shown to be actually sterile.

Another question arises: What plants shall we inoculate for? Under all the ordinary conditions, I feel sure that whereever red clover will grow, or has grown in the past, you already have inoculation, because it is an old plant. If red clover fails to grow it is very often some question other than inoculation.

Take soy beans or alfalfa or vetch, which never have been grown in your county before. It may be that soil inoculation would be needed, but it is not always vital. For instance, I know that vetch, in some localities, will show nodules on the roots the first year it is grown, without inoculation. The same is true of soy beans, and it is certainly true of alfalfa. Alfalfa has been sown on lands which will show abundant inoculation within a year or two. One explanation is that the particular germ which lives upon alfalfa may be associated with the seed, and when the seed is put into the ground it carries with it sufficient bacteria to start inoculation on the roots. The other explanation seems more reasonable to me; that is, that we have already in our soils certain bacteria that grow upon allied plants, which are nearly enough alike in their make-up so that the bacteria can immediately and successfully change their habits and live upon the roots of alfalfa.

On the other hand, let us remember this fact — that there have been certain soils where it seemed as if the matter of inoculation made the difference between success and failure. It simply shows that there is no set rule to follow.

A man in Saratoga county tried alfalfa, and it did not do well for him. Yet he noticed that in one small section it was coming in green and looked all right. He puzzled over this and finally noticed that this spot was where he had thrown down his empty seed bags, and he believed that the mere shaking of the bag scattered dust which started the seed.

I do not believe that we are usually justified in thinking that inoculation can help us with clover, beans or peas, because these are old plants that have been tried again and again, and on nearly all New York State farms there are already bacteria which go to the roots of such plants. On the other hand, if one is trying vetch, soy beans, alfalfa, or any other legume which is new to his locality, then it is advisable to try inoculation. He may reasonably expect help from it.

VARIOUS LEGUMES; THEIR STRONG AND WEAK POINTS

What plants are we to try to grow for the purposes of soil enrichment? Much has been said about red clover, and I think it is sound. When it comes to legumes, there is no other that has been tested out so widely; no other that has shown such a wide adaptability as that wonderful plant — red clover. Sometimes I think that when we get ready to put into the growing of the red clover plant the same amount of enthusiasm that we have given freely to the alfalfa plant, we may find that red clover has possibilities we have lost sight of. I place red clover at the head of legumes. I have often said that there is no plant on New York State farms that has the possibilities of the red clover plant, except the alfalfa plant under favorable conditions.

FIG. 505. ALFALFA IN WARREN COUNTY.

Alfalfa is somewhat limited as to the soil it is grown upon, because it is a plant which seems to be more insistent upon soil requirements than red clover. If we have a soil that is well drained and limed and is in favorable condition for alfalfa we ought to be thankful for having a good farm to begin with.

'There is another plant which is now being recognized, the history of which is new, and that is the vetch. It is a very hardy plant, a plant which has been universally claimed to be of cast iron hardiness. It is a plant which is credited with being less insistent upon lime than either red clover or alfalfa. Where a man has no lime, it is a plant that he can turn to with better success than to either clover or alfalfa.

We have in our state today two different ways of handling the vetch plant. One is to sow it with the rye in the fall. But let me urge upon you to get your rye in fairly early. One can delay putting in rye almost until the ground freezes up, but I do not believe that vetch has the cast-iron hardiness of rye. Sow vetch some time in August or early in September; do not wait until October, as we might wait with rye.

Further north, up along the St. Lawrence river — a country a great deal colder than here — they are sowing their vetch in the spring with oats. The theory is this: Vetch will make their oat straw better. I have seen, this winter, where there is quite a little sprinkling of vetch seeds with the oats, but there is a quantity of oat straw that has considerable vetch with it. It is reported that in many cases where the oats are cut to harvest, the vetch comes on astonishingly. Moreover, it lives through the winter, and the second year they have their red clover with a considerable proportion of vetch with it. The clover seed and timothy seed, as well as vetch, are sown with the oats. I have met many men who report astonishing success with vetch. If it works well it means a considerable amount of pasture in the fall after the oats are cut. Shall we use it as the older method, mixed with the rye in the fall; or shall we sow it with the oat crop in the spring? I think it will be a matter of climate, and whether or not you keep dairy cows. I am going to put in two bushels with our oats this year.

There is one other leguminous crop about which we have said a great deal in this section of the state — the soy bean. I think it is the richest of any legume. I believe I am correct when I say there is no other legume we raise that has a larger amount of

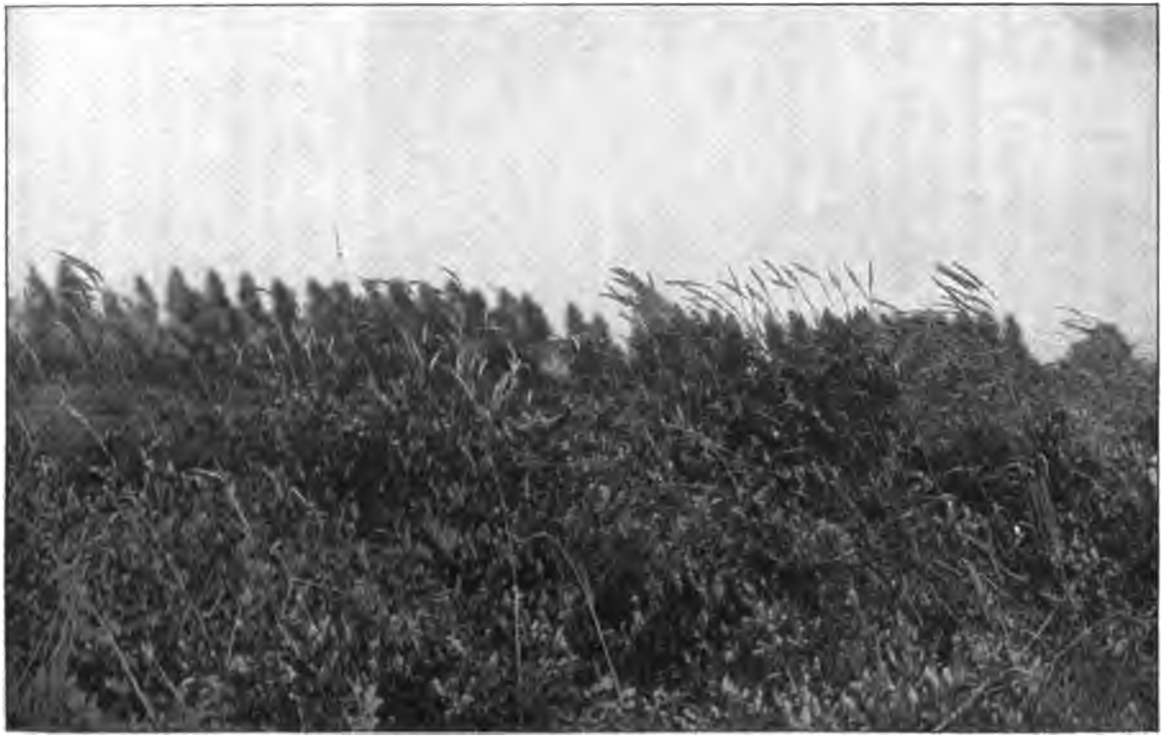

FIG. 506. RYE AND VETCH VALUABLE AS A SOIL BUILDER OR FORAGE.

fat or oil, and protein, than has the soy bean. However, I do not believe the soy bean is at home in New York State. It is a hopeful plant to grow, especially in connection with corn, and we should sow perhaps half as much soy beans as corn. In our own work I have never yet had a crop where the soy bean had a very large ratio to the corn. At the same time, remember this, that what you do get has a very high value. In the first place it is a protein food, and in the second place it has a special value because it tends to bring up the protein content of the silage.

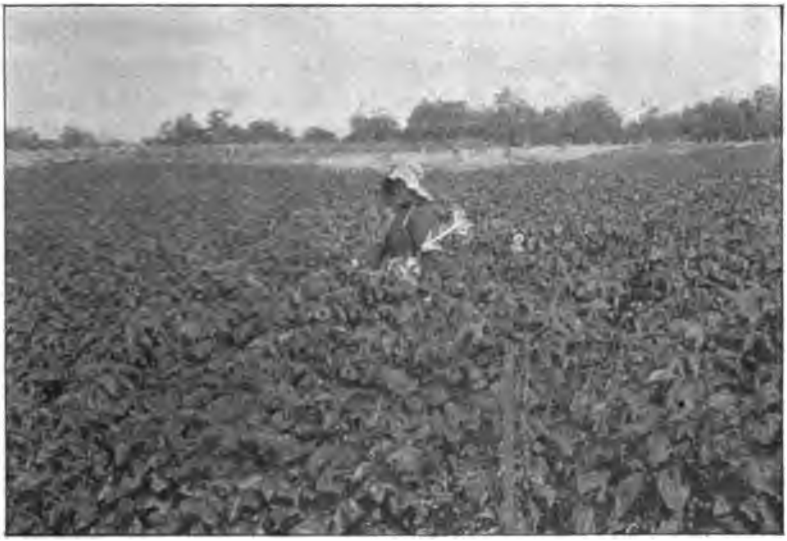

FIG. 507. SOY BEANS. YIELD, 4,300 POUNDS OF HAY PER ACRE.

The great fault of corn silage is that it has such a large proportion of carbohydrates and fat, and such a small proportion of protein. In the Middle West there has been a great deal of developing. They attempted to develop corn which had a large amount of protein. The facts were that when they cut that corn with a high yield of protein, their yield per acre was lower. Our plants should be allowed to fill the place that Nature designed them for. I have not very much confidence myself in selecting plants for special composition. We had better try to make up the deficiency by some companion crop grown with them.

The cow pea is out of its latitude in New York State. I have tried again and again to grow it, but the crop has never returned the cost of the seed. The cow pea makes a little bush growth here. In the lower Hudson Valley, and on Long Island, there may be a few localities favorable to it, but I doubt very much if it has any place in western New York.

Crimson clover is another good legume. It does wonderful things in Maryland and southern New Jersey. Professor Agee will bring you great tales today of crimson clover. So far as I can see (with the few exceptions of the Hudson Valley and Long Island), crimson clover has no place in New York agriculture. It is a tender plant.

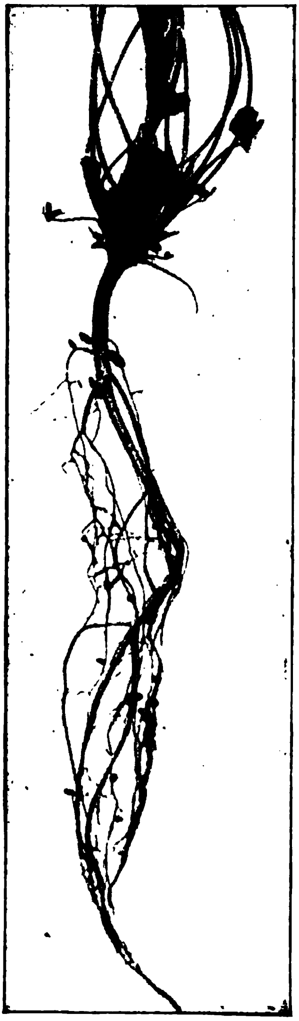

FIG. 508. ROOT OF ALFALFA, SHOWING NODULES. NATURAL SIZE.

LEGUMES FROM THE STANDPOINT OF SOIL BUILDERS

I have talked of alfalfa and of vetch from the standpoint of the animal feeder. There is another standpoint — soil building for a cover crop. If there is any part of the state, outside of Long Island, where consideration should be given to this, it is right here.

I wish to say a little more about the theory of a cover crop. Professor Cross emphasized the need of organic matter in the soil. Those soils that we call worn out and poor and exhausted, are poor, not so much because of the phosphorous, potash and lime that have been taken out of them, as because of the organic matter which has been decayed out of the soil. That organic matter disappears very rapidly, and then the soil goes back again to the rock dust that it was in the beginning, and that is a very poor thing to grow crops upon.

A cover crop immediately increases the percentage of organic matter. When organic matter is present in the soil the water-holding capacity is increased, and fertility is brought from low depths and put near the surface where it is needed.

I once read a story of an old English gardener who wanted to know about things. One day he started to dig out a parsnip and it broke off fourteen feet deep. Dig down, if you will, and just notice the depths of the roots of the grass in a ditch. I think you will be ready to believe that the roots of our plants penetrate to an astonishing depth.

The red clover owes a great deal of its value to that great taproot, and if soil is well drained it will go to astonishing depths; if not well drained, the roots will go very deep. After the plant has a taproot it does not find very much nitrogen, it is true, since the nitrogen is in the upper soil. But so far as the potash and phosphorus are concerned, there is just as much down

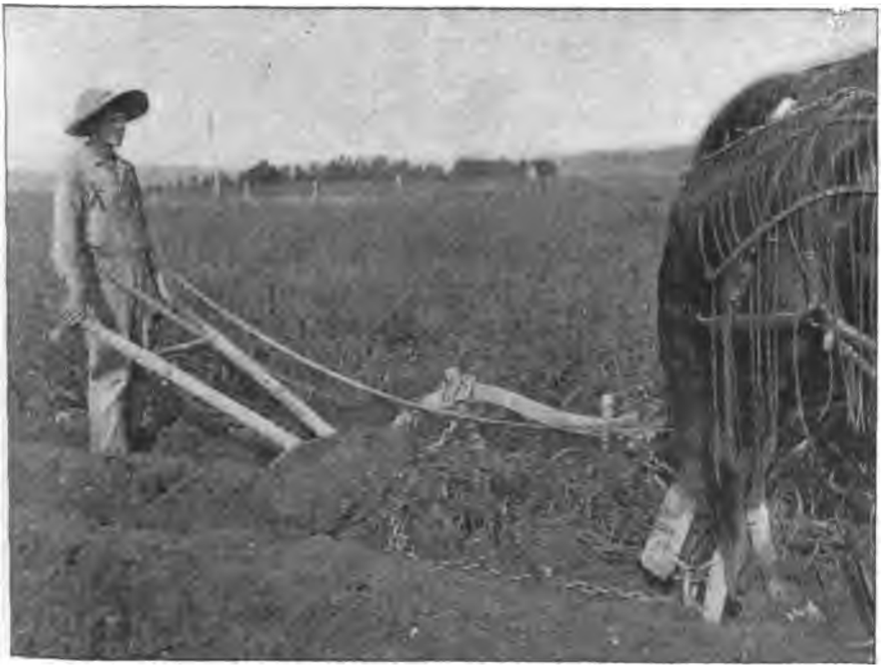

FIG. 509. GREEN-MANURE CROPS SHOULD BE PLOWED UNDER AS SOON AS THEY HAVE ATTAINED THE DESIRED GROWTH.

there as nearer the surface. When that plant dies it is left up at the top of the soil for the young plant.

The man who grows any kind of a cover crop does well. If he grows rye he increases the water-holding capacity of the soil. The same is true as to rape and buckwheat. The man who grows alfalfa, clover, vetch, beans or peas, does everything that the other man does, and in addition to that he gathers nitrogen from the air.

There is no argument necessary about the leguminous plants. A man will write in to some alleged agricultural expert and say, " I have a piece of very poor land in the country on which nothing will grow. What shall I do to renovate it ? " A reply is sent back saying, " Sow clover seed." I believe, in the case of very poor land, we should begin somewhere else. To a less degree we should try rape or oats and get some organic matter in the soil; then we will gradually get the land in condition to grow those crops. The best thing is to grow alfalfa and vetch and plow it under. and yet it is a theory which breaks down where the soils are very poor.

NECESSARY REQUISITES FOR GROWING LEGUMES

What are the requisites to the successful growing of legumes? Legumes grow best on well-drained soil; they insist upon good drainage. That is particularly true of alfalfa and red clover. The first thing is drainage; the second, lime. Vetch has the reputation of not being insistent upon a limestone soil. Clover, alfalfa and soy beans require lime for successful growth. I should say that the question of fertility, perhaps, comes third. However, some of our plants are able to make quite good growth if they have only a well-drained soil.

I shall give you an illustration of this in the growing of alfalfa. Some of the most successful crops of alfalfa in New York State are grown on soils which were once called poor soils. The character of them was practically gravelly. Gravel is ordinarily unsatisfactory to grow crops on, because its water-holding capacity is poor; it is over-drained. The second reason is that the soil particles are relatively large, and because they are large, have a limited surface. The amount of surface in a cubic foot of soil is dependent upon the size of its particles. Because you have many square feet of surface it is more soluble, and ordinarily there is more available plant food in a fine soil. Ordinarily, a

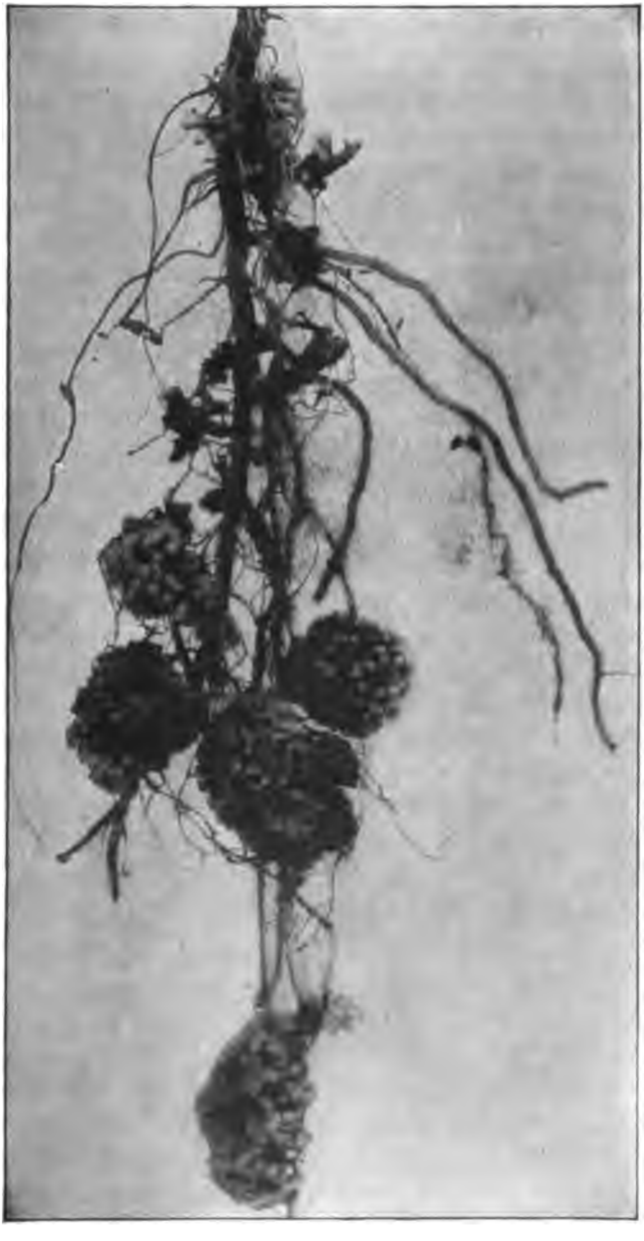

FIG. 510. ROOT OF CANADA FIELD PEA, SHOWING VERY LARGE NODULES. NATURAL SIZE.

gravel bank is a poor place to grow crops. On the other hand, there are some gravel banks giving a surprisingly good crop of alfalfa. They may have been over-drained, and yet the alfalfa can establish its roots so deep that it gets the moisture and fertility.

A soil that is very poor, lacking in lime and organic matter, is the soil we want to make better. Clover, alfalfa and other leguminous seeds sprinkled on those soils never bring anything back to us that is worth while. On our good lands where clover grows, let us grow more of it than we ever did before, because a man who grows a leguminous crop is doing something that the other man is not doing; he is gathering nitrogen.

The man who has very poor soil to begin with — soil that is discouraging — must find a legume suited to that soil. I should try vetch first. If the vetch did not grow, I should drain, then add lime, and then fertility. I should begin with the tough, hardy, non-leguminous plants, which will grow, and build up those soils.

MR. VAN WAGENEN: We have ten minutes for discussion.

QUESTION: What would be the value of ground limestone on a sandy soil? What effect has the war on the price of nitrate of soda?

PROFESSOR AGEE: We have learned that finely pulverized limestone will meet the lime deficiency in the soil just as well as any other form of lime, if we apply an amount that is equivalent in strength to burnt lime. Take one hundred pounds of lime and burn it, and you have fifty-six pounds of burnt lime. If I pulverize the limestone and apply it, the one hundred pounds will neutralize just as much acid as the fifty-six pounds of burnt lime. If on a light sandy soil, where magnesia is used with the limestone, the pulverized is preferred. If it is a calcium limestone, the burnt is just as good.

MR. VAN WAGENEN: Are you inclined to stand for the doctrine that no man ever put too much lime on land?

PROFESSOR AGEE: Experience has been our best guide in this regard. Land was nearly ruined in Chester and Lancaster counties, Pennsylvania, fifty or sixty years ago, and some lands are being ruined today in western Pennsylvania, by applications of lime. Thirty-four years ago Professor Jordan, of Geneva Experiment Station, started some soil-fertility experiments at the

Pennsylvania Experiment Station. He planned to put on two tons of fresh burnt lime per acre every four years; their fertility has gone down. We know that an excess of fresh burnt lime will burn out vegetable matter. If it is used in a rational amount it is safe.

MR. VAN WAGENEN: Then the nitrate of soda question.

PROFESSOR AGEE: Well, shipments are interfered with. I know vessels that have been interfered with, by our friends the enemy. But we are getting nitrate of soda, and it is being put upon the market at a fair price this year. It will probably be higher next year.

QUESTION: What kind of hay does vetch make?

MR. VAN WAGENEN: Very good hay, because its stems dry very quickly. It is richer in protein than clover and alfalfa.

QUESTION: Is the winter vetch seeded in the spring?

MR. VAN WAGENEN: Yes.

QUESTION: Would it do well in southern New York in the spring?

MR. VAN WAGENEN: I do not know. We are passing through a transitional experience in vetch. The men in northern New York, living in severe climates, are certainly, in some cases, making a splendid success with the sowing of vetch with oats in the spring. It simply shows the resourcefulness of those fellows. I do not know how winter vetch sowed in the spring would come out. What is your impression, Professor?

PROFESSOR AGEE: I know that if hairy vetch is sown in the early part of August it will make a crop of seed by winter.

MR. VAN WAGENEN: I think there is no question but that, in Jefferson and St. Lawrence counties, vetch seeded with oats goes through the winter in good condition, and gives, in many cases, a very astonishing amount of extra forage in connection with clover, the following year. I saw one or two cases this winter where oats were brought in containing a considerable percentage of vetch seed, which had ripened by the time the oats were cut.

QUESTION: What amount of seed would you use?

MR. VAN WAGENEN: The very general advice which the farm bureau men are putting out is six to eight pounds of vetch seed per acre sown with the oats. You have the best climate in the state, outside of the Hudson Valley or Long Island. Vetch is not exactly a tender plant, and here you could put it in later.

QUESTION: Alfalfa needs a good soil. How do you explain this condition? Alfalfa seed was mixed with red clover seed and sowed on land where other plants did not do well. The alfalfa came up successfully.

MR. VAN WAGENEN: I should say that where that alfalfa succeeded well the soil may not necessarily have been fertile. I have not lain any stress upon fertility. I should guess that perhaps you had sort of a gravelly loam.

VOICE: Not gravel, but limestone. I got more alfalfa on one part than the rest.

MR. VAN WAGENEN: Well, you had lime, and the probabilities are that you had excellent drainage. Put those two things together and you have suitable conditions for alfalfa.

VOICE: It was on the crest of a ridge.

MR. VAN WAGENEN: With alfalfa I lay stress upon drainage first and let the fertility come later.

VOICE: I had a piece of land flooded with water. I sowed alfalfa with pea seed on this land last spring, and I have as nice a stand of alfalfa as I should wish to see, and I cut it twice last year.

MR. VAN WAGENEN: I can imagine that, even with those floods, the land was well drained.

VOICE: We had no sub-drainage; the surface drainage is all we have.

MR. VAN WAGENEN: Professor, what do you think about the drainage proposition with alfalfa?

PROFESSOR AGEE: I believe that in ninety-five cases out of one hundred a man who sows alfalfa seed on wet land will throw away money. Good experience is with Mr. Van Wagenen; it is a question of drainage.

MR. VAN WAGENEN: I fall back on the old doctrine that in nearly all cases it will be a waste of alfalfa seed to use it unless you have good drainage. I might go far enough to ask this question: "Was this a piece of land where red clover had grown?"

VOICE: There had been no red clover on it for years.

Meeting adjourned at 12.05 P. M.

SECOND SESSION

MONDAY, MARCH 15, 1:35 P. M.

ROUND TABLE

Meeting called to order by Mr. Van Wagenen.

QUESTION: What is the relative value of a good cover crop as expressed in terms of commercial fertilizer or manure?

MR. VAN WAGENEN: I think there is little room for doubt that this question cannot be answered. Let me say that we have entirely satisfactory valuations for nitrogen, potash, phosphorus and lime. The chemists get together and agree on what might be called the official value. But you cannot apply that to the question of humus; so far as I know, no one has given it a definite value, in dollars and cents. You can go into the markets of the world today and buy a pound of soluble nitrogen for approximately fifteen to seventeen cents; you can buy a pound of soluble phosphoric acid as low as four cents, or less. This year, of course, the values of potash are entirely upset; we cannot presume to put a value on it because the supply is uncertain, and we shall have to get along without much potash. We also have quite definite values for lime. No man, as I say, can put a value on a ton of humus, one reason being that the value will vary greatly with the soil on which it is used. There are some muck soils where the percentage of vegetable matter is so great that a man could not afford to pay for it. Nearly all of our soils need humus. If you submit a ton of commercial fertilizer to the chemist, he will tell you the amount of potash in that, and you may feel that it is correct; take a ton of manure or cover crop, and he can tell you how much potash or humus there is in it, but at present he cannot think of putting any particular valuation upon the humus. That is the way I should answer that question.

QUESTION: It is recognized that a large amount of potash is present in our soils — especially in our heavy soils — but largely in an unavailable form. Have we any special cover crop, or is there anything that can be done, to liberate that potash and make it available?

PROFESSOR CROSS: That point will be taken up in my talk this afternoon.

QUESTION: What is the chance of securing alfalfa?

MR. VAN WAGENEN: If you go down into what is called the natural alfalfa country of New York State, you will find it is largely comprised of four or five counties, chief of which is Onondaga. It extends also into Cayuga, Herkimer and Madison. There is no question but that men are sowing alfalfa there with the wheat in the spring in a careless fashion and getting good stands of alfalfa, but I doubt if it is the very best way.

PROFESSOR AGEE: My mind always goes back to fundamental principles when any problem comes up respecting farming. In our humid climate, one chief enemy of alfalfa is the summer weeds. In the west, where alfalfa is so much at home, that difficulty does not exist. In the east, where rains occur so often during the summer, we have a soil usually more or less polluted with the seeds of summer grasses. When we start alfalfa in the spring there is always that danger, unless one has a special soil — a peculiar soil in which such weed seed does not abound. It is for that reason we talk about August seedings, not only of alfalfa, but of red clover and timothy, where one is failing to get a heavy, clean sort of red clover by spring seeding. Then again. alfalfa is a crop to stand — say four years. Four years appealed to me always as a natural lifetime of alfalfa sod in a humid climate. We should count upon alfalfa as doing very well indeed if it gives a profitable crop in four years.

It is more important to me to have a perfect stand of alfalfa than of red clover. Alfalfa is much more important, and I must have a good stand. If I can get a better stand by seeding in August, then I can put up with some imperfections. I have seen fine alfalfa sown with oats in spring. If land were sown with alfalfa as it is with red clover — plenty of lime and inoculation and good drainage — we could probably sow it in the spring as safely as we can red clover. In this latitude, with a humid climate, I can get a better stand of alfalfa in ninety-five acres out of a hundred if I clean out the seeds in July and sow the first week of August. I believe this is in line with the experience of most growers throughout the country. The Walker-Gordon people in New Jersey grew, this year, 1,800 tons on a soil which needed special treatment. They used four tons of limestone an acre. I do not believe you could get them to sow any in the spring.

MR. VAN WAGENEN: I should like to bring to you a little different experience, owing to the fact that at home we are 1,200 feet above sea level. Under those conditions frosts come a little earlier in the fall, and winter lingers later in the spring, and my feeling is that August, with us, is too late. With a short season on our heavy soil, I should prefer to run the risk of the summer weeds and sow the alfalfa in June, than to wait to kill them out and have a shorter season for the alfalfa.

That statement, however, is not saying a word against what Professor Agee is saying about New Jersey, and I am not sure but that his advice is best. There are certain portions of the state which I believe are constantly working towards earlier sowing, in order that the plant may have considerable root system before winter. Just these days are hard on the seeds put in last summer, or August. My opinion is that the plant which grows to a considerable size in winter stands a far better chance of coming through successfully with weather like this.

QUESTION: Would it be a good proposition to put some timothy with it?

MR. VAN WAGENEN: If you go down near Syracuse, which is the center of alfalfa growing in New York State, and perhaps in the East, you will find that the men there who have grown it the longest and who are growing it the most universally, are, almost without exception, adding some timothy with it. Mr. Worker tells me he has sown timothy with alfalfa. He says that in every field there are a few spots where alfalfa is not going to grow — possibly where the land is a little wet — and that he would rather have those spots covered with timothy than with nothing. Besides, alfalfa cures nicely, and possibly better, with a mixture of timothy.

PROFESSOR AGEE: There are cases in which it is always best to mix seeds in making sods.

QUESTION: Should alfalfa be fed to horses?

MR. VAN WAGENEN: I think on those farms where alfalfa is so widely grown, they say it is good for anything. Alfalfa hay is not discriminated against by horse dealers and veterinarians in Syracuse. I never aim to give veterinary advice, because a man is foolish to do that unless he knows something about it. I think we shall ask Dr. Volgenau as to whether he thinks alfalfa hay should or should not be fed to horses.

QUESTION: How about cutting alfalfa with timothy?

MR. VAN WAGENEN: We cut the alfalfa when it is ready to cut, and the timothy takes its chances. If your alfalfa grows so well with the timothy out, so much the better; but if the alfalfa fails and timothy is in, it is an advantage. If alfalfa fields stand four years (which Professor Agee has suggested is the proper time), let us get away from the idea that alfalfa is going to live forty years. We used to think that if one did succeed with alfalfa, his grandson would have it; but where there is one field that stands ten years, there are a great many that stand only three. The timothy, which is a perennial plant, will do better.

QUESTION: Do you know anything about the Grimm alfalfa growing in this state?

PROFESSOR AGEE: I do not know of an experiment in the East with it, I mean New York and New Jersey. Doubtless it is being tried, but I have no results.

MR. VAN WAGENEN: I think that such experimental work does not show that Grimm alfalfa has especial adaptability to New York State conditions, except in the extreme north or at high altitudes.

QUESTION: We have a field of rye which was sowed the first of November. We intended to sow wheat after beans; but, as the beans were so late that we could not sow the wheat, we sowed rye. As we did not get it in until so late in the season, we thought it might be best to use commercial fertilizer and we intend to put on the commercial fertilizer as a top-dressing this spring. Do you think it would be apt to burn the grass seed sown in the spring? What effect would it have?

MR. VAN WAGENEN: I think there is no possible fear of any injury to vegetation from the broadcast application of a reasonable amount of commercial fertilizer of any kind. I cannot believe that the broadcast application of it can ever hurt anything.

I think you should use some nitrate of soda. Rye is a plant of such singular hardiness and ability to stand trying conditions, that if it is germinated in the fall it ought to come through in the spring. I have an idea that acid phosphate is a great deal better. Let me say very positively that you can always grow a plant with acid phosphate. We use a great deal of it at home. I have been accustomed for years to see bags of it around the field, and I have seen four quarts of it fall on the ground in a heap and the vegetation grow up there without any harm.

VOICE: You can burn potato plants to death with fertilizer.

MR. VAN WAGENEN: Commercial fertilizer, especially. Professor Cross, you are more familiar with the action of that material. Have you any particular advice to offer us as to the application of muriate of potash and nitrate of soda, in regard to the danger of burning vegetation?

PROFESSOR CROSS: In small amounts, no; but in cabbage plants and potato plants there is some danger of burning.

MR. VAN WAGENEN: My impression is that you may use it over any crop you have, broadcast, without any danger.

PROFESSOR AGEE: I have seen it applied using about 150 pounds of nitrate of soda, 150 pounds acid phosphate, and 50 pounds muriate of potash, and the man put it on twice as thick as we told him to, and there we got the best grass. No, I should not fear it on a tough crop like grass, in any ordinary application. I think there would be no danger.

MR. VAN WAGENEN: I once had cabbage plants ruined by a youngster who practically sprinkled nitrate of soda against the stems, and they died off the next day. If large quantities of muriate and nitrate were applied very closely to the roots of tomato plants, I suspect there would be a serious result. Professor Cross, what are your teachings regarding liability of the loss of nitrate in drainage water?

PROFESSOR CROSS: The nitrate is perfectly soluble, and unless there is something to take it up it will be lost. And we shall have loss of nitrate in drainage waters if there is not some plant to feed upon it. When your plants are young, do not put on any more than those plants will use. The nitrate-of-soda propaganda say that in the broadcasting of meadows you should not use over a certain amount thereon; they do not tell you to put on 400 or 500 pounds of nitrate of soda. They are honest, I think, and they will tell you not to put on too much. Suppose you are going to use fertilizer on cabbage and have to use considerable during the season. You set the plants in the water and apply some to start the plants off in good shape, and when the plants become larger you use another application. If you put it all on together and have a wet season, you are going to lose a large part of it. It is just as soluble as salt or sugar.

Mr. Van Wagenen: There is one man I am always glad to have a New York State institute audience know, and that is Professor Agee — because I have never had a doubt either as to the soundness of his doctrine or the sincerity of his message. I should like to say to you that Professor Agee was, for many years, a good farmer and a potato grower in Ohio. Later he became connected with the Ohio Experiment Station, later with the State College of Pennsylvania, and later with Rutgers College, of New Brunswick, New Jersey.

THE IMPORTANCE OF PROPER CROP ROTATION

Professor Alva Agee, New Brunswick, N. J.

Soil fertility problems interest me much, and this morning I learned much more about the soils of this county than I knew before, although I have been in the county and, under the guidance of my good friend, Mr. Smith, I drove over it several years ago, looking at the farms. And then again, I was especially interested in the talk that Mr. Van Wagenen gave this morning — one that treated so fairly a difficult subject.

In any soil fertility discussion there must be room for crop rotation; and, when I complained to Mr. Van Wagenen that Mr. van Alstyne had assigned that subject to me when I had never felt fully competent to discuss it, and had not done so in the past, he, in his diplomatic way, said that it may have been a compliment from Mr. van Alstyne. That made me drop the complaint.

Crop rotation should be included in farm fertility discussions, because it is a most important factor. A few years ago it was my privilege to drive over the old National road, for which appropriation was made by Congress in the early part of the last century — a road that was to open up the West, so that the crops west of the Alleghany mountains might come to the more populous regions near the seaboard. I drove from Columbus, Ohio, through Pennsylvania and Maryland. It was worth a great deal to me, because it took just that sort of thing to impress me with the newness of our country's agriculture, so far as the greater part of it is concerned. Those discussions in Congress with respect to the right of the national government to appropriate the funds of the nation to such an undertaking you will find in the Congressional Reports of about 1815 or 1820 — discussions regarding the wisdom of appropriating money to build a road that was to be the first outlet for the greater part of the agricultural lands of this country. Take, for example, your Erie canal; I

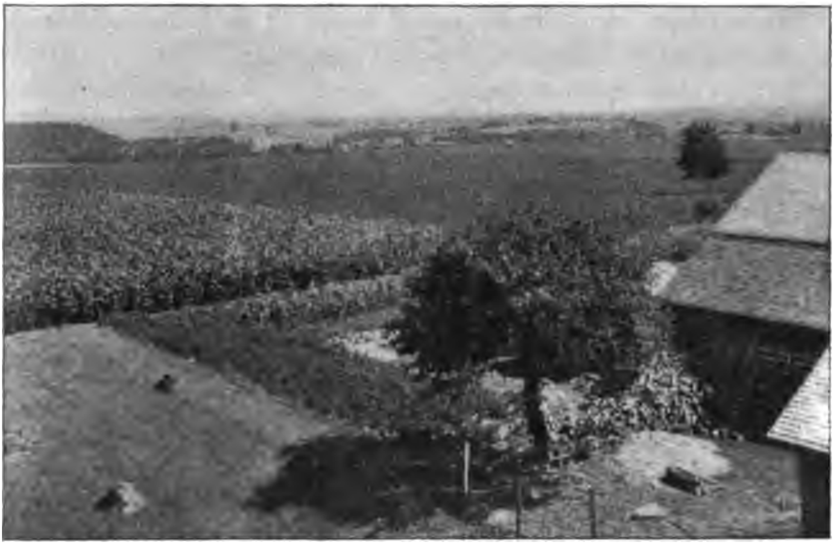

FIG. 511. THE ROTATION OF CROPS AIDS IN MAINTAINING THE STOCK OF HUMUS IN THE SOIL BY INCREASING THE QUANTITY OF ORGANIC MATTER TO BE WORKED INTO THE SOIL. THIS VIEW SHOWS CORN, POTATOES, AND GRAIN, THE LATTER BEING FOLLOWED BY TWO OR THREE YEARS IN GRASS, INCLUDING A LEGUME.

think it was about 1830 when that matter came up — an outlet from the West to the East.

And so I came to realize, as I would have you realize this afternoon, that this new country of ours, so tremendously rich agriculturally, has had only a short time, in the world's history, to lose the best out of the soil. And, yet, see what we have done! We are hardly able to maintain old averages on our staple crops, despite the big improvement in farm machinery and methods of tillage, with increased applications of commercial fertilizers. We have seen the older peoples of the world, in India and China, starving every few years, tens of thousands of them. People in Europe have ceased to eat meat, because when crops from the soil are fed to animals a great deal of energy is lost. We recover in beef only three per cent of the energy that was in the grain that made the meat. Europe is crowded so that she can no longer afford to convert the products of the soil into meat.

MAINTAINING FERTILITY NOT THE FIRST CONSIDERATION WITH MOST MEN

And yet, in a hundred years, we have taken the cream out of the rich lands from the Alleghany mountains westward, and largely through the absence of rational crop rotation. This is the reason that it bulks big in the discussion of intelligent men such as we have here in this conference today — the matter of rational crop rotation in the interest of soil fertility. I think that the interest of our land in the long run is not the first thought with most landowners, and I have no quarrel, especially with a young man, who may not make it his first thought. He is vitally interested in the crop or crops that will yield him the most net profit this year and next year, because he must have money. He is married, if he is the right sort of a young man, and is making a home of his own. Having done so, it is a question of net income, and he figures on a crop rotation that will give him the largest possible area of that one crop which experience or observation has taught him to believe would yield the greatest amount of net profit, in order that he may pay for the farm, improve his home, and do those things which are necessary and require money. And when we discuss crop rotation we are all the time influenced by that one factor — that one question: What will give the necessary immediate profit for the first five years?

A single crop, although profitable, will in the end deplete the soil. I live only a short distance from a potato-growing district which, a year ago, supplied potatoes to every state, except two, east of the Mississippi river. Hundreds of farmers around the one town of Freehold ride in automobiles, because they have a right to ride in automobiles — making money from potatoes. And when I get down among them in the meetings, as I do so much, I tell them that they are hunting trouble in the long run, and that no man can plant potatoes year after year, or two years out of three — depending upon crimson clover or wheat or rye, according to the time the potatoes are dug, to give him some vegetable matter, and depending upon 1,400 to 2,000 pounds of a 4-8-10 fertilizer to furnish him plant food. I say that a man who does that cannot fail to meet trouble in the end, because he is violating the laws of nature. And they say to me, "Yes, but this field five years ago produced so many barrels of potatoes, and my income was so much; four years ago it was so much; three

FIG. 512. RED CLOVER — THE FARMER'S STANDBY.

years ago so much. Then I omitted a year. Last year I had this yield and it counts up hundreds of dollars an acre." And they say, "Can I forego that money?" And yet, violating, as they do, the principles of a rational crop rotation, the time must come when there will be plenty of trouble in a potato-growing district of that sort.

HOW SOILS ARE BUILT

You are practical, successful business men. I want to discuss principles with you a little bit. Some of you may not agree with me, and if you do not, please interrupt me, and the hour will not be wholly wasted. The method I have discussed is irrational because it goes against Nature. How were our soils built? What did Professor Cross tell us this morning about organic matter? Suppose you and I were to abandon a piece of land. Nature would try to produce some organic matter to restore that soil, so that it might once more become productive. The soil is an immense body of inert plant food. Productive soils were made in the beginning by a bit of growth of organic matter which induced more growth, and decay freed a little more of this inert, natural strength, and when the soil had enough fertility there grew a plant three feet high. When that plant rotted, more matter was freed, and a four-foot plant could grow. The soil was increasing its power to produce through the increase of vegetable matter. You and I, as landowners, come in and take off a part of what grows and convert it into cash, which is man's right. But whenever we reduce the amount of material that the soil absolutely needs to free some of its natural strength, we lock up that inert plant food as tight as possible, so that the soil is helpless.

CROP ROTATION SHOULD INCREASE ORGANIC MATTER

Crop rotation is essential, first, because through rational rotation we permit the soil to secure somewhere near its rightful share of the vegetable matter it can produce. In the particular rotation that I mentioned, potatoes and crimson clover, the soil is not getting back its rightful share of vegetable matter. And when you take the land's share you rob yourselves in the long run, because you render the soil helpless. Provision for organic matter is fundamental in any rational crop rotation, and we have made full provision. Soil fertility problems interest us because our land shows lack of vegetable matter and it is not retentive of moisture. Rains do not come every six or seven days, and so there is a cut in yield as the result of drought, due largely to the failure of our farm scheme to provide for the land all the organic matter that it needs. That is a most practical point; it goes right down to the root of the matter with respect to income.

Fig. 513. Silage Corn, Increasing in Favor in the Fruit Districts.

AN OLD STANDARD ROTATION

Let us, in our conference, take an old standard crop rotation — one that has commended itself to tens of thousands of farmers, that dates away back to the early history of our agriculture, and therefore must have good in it — and see what effect it has upon the supply of organic matter, and also see what other good things come out of such a rotation. I am referring to one that possibly none of you here want to practice — to the old-time crop rotation of corn, oats, wheat, clover, timothy — we will say five years'

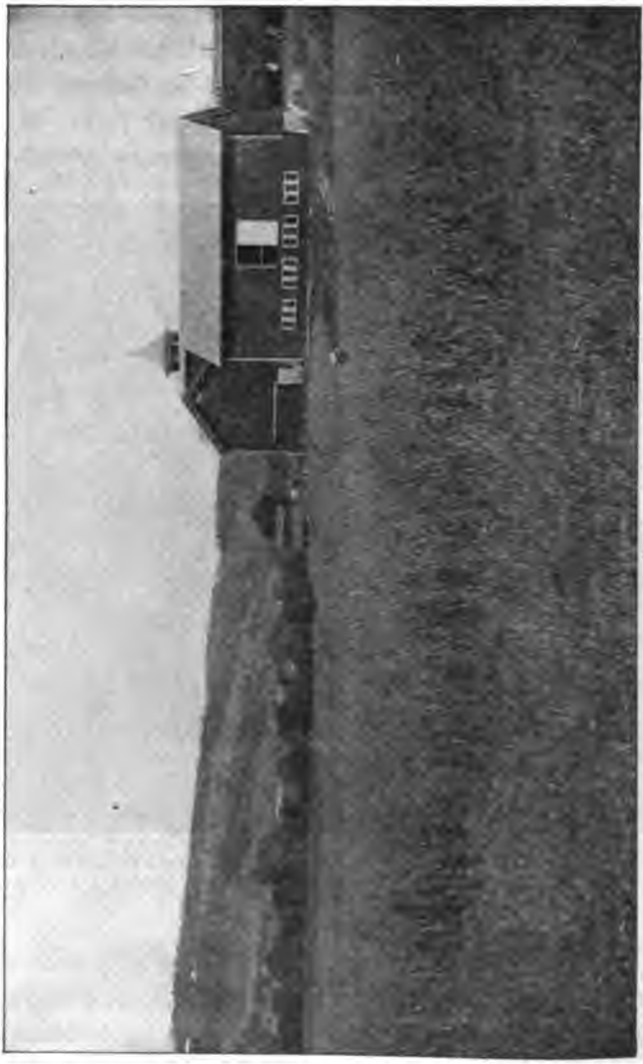

FIG. 514. OAT FIELD IN MADISON COUNTY.

rotation. It has advantages, or it would not have compelled acceptance by such a large number of farmers.

In the first place, it provides for a sod two years out of the five. That is pretty fair. If there is enough goodness in that land the sod is heavy. In the second place, it provides the leguminous crops that Mr. Van Wagenen mentioned this morning, which is of great advantage. Another reason why that rotation became so acceptable was that it provided for distribution of labor. In the early days a man was largely dependent upon the labor that he and his own boys would perform on the farm. He must have a distribution of crops such that he could do nearly all the work that was done. See how nicely that rotation takes care of that point! Some specialists have the burden of idle horses throughout much of the year, and there is also inability to get labor to do work on time.

Here is a man who has corn, oats, wheat, clover and timothy. He plows his land for corn in the fall. If it is a heavy soil, he gets that work done before Christmas to get it out of the way. Oats can be seeded in the spring before corn is planted. And so the work goes on. Corn planting comes after the ground warms up. The hay harvest — the clover, and the wheat and the timothy — comes together just a little bit too closely for comfort; one failure in that rotation for the best possible distribution of labor, it is true. But see how nicely it comes around! The corn wants all the summer heat, and so you let all the summer go to the corn. The oats do not require the ground until the next spring. In the early days the oats were out of the way in time to make a good seed bed for wheat, because there was so much vegetable matter in the soil that when the oat stubble was broken a good seed bed could be made; the physical condition was better. I am speaking of the time when this rotation was first adopted.

Here is another advantage: The timothy is sown with the wheat, and the labor goes upon the wheat crop. The wheat pays the bill for preparing the land and the timothy is seeded without expense, except for the seed. The timothy is sown in the fall when fall rains are very apt to come, and you are reasonably sure of germination. The next spring you sow the clover on the ground, and it does not matter whether you cover it or not.

FIG. 515. TYPICAL WHEAT FIELD.

There is no expense in getting the clover, except for the clover seed and actual labor of distributing it. That is what I mean by the good distribution of labor which commended itself in that old five-and six-years' rotation.

DOES NOT PROVIDE ENOUGH VEGETABLE MATTER

But what is the matter today? That rotation did not make full provision for all the organic matter that was needed, with the result that as land grew older, with less vegetable matter in it, it suffered more from drought. Men say to me, "Our seasons are not so good as they were a generation ago. My clover is failing because the summers are more droughty." We have taken so much vegetable matter out of our land that the land does not stand the waiting period between one rain and another. When the land was relatively new, if it did not rain for three or four weeks, the clover and timothy plants in the wheat stubble were tided over very nicely. If the vegetable matter is reduced to the point that the land cannot hold moisture, the plants die.

In most of the United States we have our land reduced to the point where we see that a rotation as good as that one will not provide enough organic matter to supply the full needs of the soil unless the crops are fed on the farm. I should like to follow this out, at this point, to show in what ways we have improved, before I take up other reasons for crop rotation. In the case of thin land, where a man wants to build up the soil, it has been demonstrated that it is wholly feasible to introduce at least two legumes in an ordinary four- or five-years' rotation. This far north, oats are profitable; a little farther south there is too much heat the first of July for oats, and we do not get profitable yields.

ADVANTAGE OF THE SOY BEAN

Here I believe we could substitute the soy bean in place of the oat crop in the case of thin land. It gives us a hay as rich as alfalfa. The soy bean stubble should not be plowed before seeding to wheat. During the summer the top of that somewhat poor soil is aired and plant food made available. That soil ought to be left on top when sod is wanted.

A crop rotation looks largely to a provision of organic matter for the soil, and no matter how much I am thinking of the money I will get from cash crops in the four or five years of a crop rotation, my land is looking forward to the sods that are going to make it fertile for another five years. The soy bean leaves the soil in the finest possible condition for seeding to the timothy and the clover. The heaviest part of the soy bean roots is up near the surface. A wheat crop after soys will make a few bushels of wheat per acre more than we can hope to get after oats — two, three, four bushels per acre — a most reasonable expectation on a seed bed of that sort.

If we want a four-years' rotation, we have corn that may be fed upon the farm, soy bean hay that is rich, wheat as a cash crop and clover for soil building and for live stock.

ONLY STRONG SOIL WILL GROW LEGUMES PROPERLY

So much for soil building — not for increased cash returns, but to bring land up where we can get returns in the future. But that does not suit the most of us specialists today. Letters come to us from men who must have quick means of supplying organic matter to the soil — some sort of a rotation that will act quickly.

And then I think of a truth that we get from the Bible—"To him that hath shall be given." The man whose soil is fertile can seed red clover with his wheat, and have such a strong growth of clover that the next spring he can plow it under and have dollars' worth of organic matter. But nine times out of ten, the man who writes me is the man who has a thin soil, and to plow that under the next spring is chiefly hope and expectation unrealized. It will pay and he will get his money back, but it will never give to that soil enough vegetable matter to enter into another crop rotation.

A question was raised here this morning in reference to sweet clover. Some other legume may develop so that a man may give back to the soil a considerable percentage of vegetable matter during the year in which he is growing a crop that he intends to take from the ground. But I warn you that the soils of this country will go down in productive power, regardless of the commercial fertilizer we are using, if we depend simply upon cover crops and makeshifts. Such rotation will give us money for five or ten years, but it cannot keep our ground up to the point where it can feed the increasing millions in this country.

ROTATION REDUCES INSECT AND DISEASE INJURY

Another thing a crop rotation does is to give us control of insect and fungous foes. When we permit our birds to be destroyed, as we are doing, the danger from insect foes increases prodigiously, and crop rotation is one of our best means of controlling their depredations. As a rule, in the case of fungous foes or of plant disease, our best remedy for soil troubles is found in rotation.

When I began farming potato land that had grown potatoes for shipment to the southern market many more years then than I am now years old, I presume—when every boy looked forward to the day when he should go with the flatboat load of potatoes down the Ohio to southern planters—before we had railroads running direct into the South from Iowa and other potato growing sections, the custom was to grow potatoes year after year, oftentimes, on the same ground. In one field upon which I, as a young man, was dependent for a living, the soil became so infested with the spores of the potato scab, that the crop was absolutely unmarketable. I am mentioning that just as an illustration of the spread of disease, in most crops, that comes from the lack of rotation.

Men come to me and say, " Why can't I sow red clover after my very early crops year after year?" Because the soil becomes unsanitary. Most plants cannot follow themselves continuously any more than animals can continue to live in their own filth year after year. The rotation is a means of sanitation.

Now I leave it wholly to you men here as to the conditions in Orleans county. If your land is filled with vegetable matter — if your scheme of farming is such that the soil grows more retentive of moisture — you have wasted three-quarters of an hour in thinking about it. If your soil tends the other way, you are up against the liveliest problem possible.

DISCUSSION

QUESTION: Would it be better to sow wheat after white beans, rather than oats?

PROFESSOR AGEE: I speak only from what I have heard, but it has always been my understanding that bean stubble is regarded as a very fine prospect for wheat. This is not chiefly on account of the fact that beans are a legume. Moisture is the controlling factor in plant growth. The manipulation of the soil to secure the right amount of moisture is the serious thing. Do not be afraid of a firm soil. Some of us have the idea that we ought never to seed down until we have made the ground as loose as possible, to a great depth; this is a mistake. We have found it possible to make heavy sods on a land notably poor, simply because the summer was used in shading it, in collecting moisture, in permitting some increasing firmness, in aëration of the top two or three inches. It is those few things that are more important to a tiny plant than all the rest. That is one reason for August seeding to alfalfa. In this latitude I think the first of August is a good time to sow alfalfa or clover.

QUESTION: Do you recommend a crop rotation with corn omitted? We do not grow much corn here.

PROFESSOR AGEE: Yes. I would not undertake to advise successful men of a locality with respect to a specific change in their crop rotation. I think that if you do not grow corn, you should probably grow the soy bean. After that comes the wheat, and with the wheat you would sow the clover and the grass. I do not know that you have any desire here to sell the hay, but you can make land richer while growing timothy. Organic matter is the life of the soil and makes it productive. If there is a stand of timothy plants when the first touch of green shows in the spring, nitrate of soda, acid phosphate and muriate of potash can make that sod a great deal thicker in twelve months. I have a right to sell timothy hay if I am making my sod thicker every year. There is no finer crop to fertilize than grass. Timothy likes the cold. If fertilizer is applied just as the frost gets out of the ground, a strong, early growth will be secured. Timothy is all right if it is treated right. Timothy is hard on land, because it is a fine implement to skin soil with, and many a man has used it.

QUESTION: How about plowing the ground down?

PROFESSOR AGEE: I could not answer that outright. It would depend upon the physical condition of the soil, and whether the ground had been well plowed the preceding season. If it is of such a nature that the disc harrow will give three or four inches of loose soil without hard digging, plowing is not advisable. Any crop rotation is bad that leads you to the use of a breaking plow more than twice between sods. The disc harrow should do the work.

VOICE: And with half as much work in that way as to plow it. It will hold moisture better.

PROFESSOR AGEE: Yes. Occasionally we find a soil that is different, but this is the rule.

QUESTION: What is the best method of applying nitrate of soda?

PROFESSOR AGEE: A good many years ago we thought nitrate of soda alone was sufficient for grass lands. Then we began to learn that while we got an increase in bulk we were not getting the weight we ought to have with nitrate alone, and so we put in some acid phosphate and some muriate of potash. Good fertilizer distributors are made for this kind of work.

VOICE: I am pretty well acquainted with this idea you have advanced here today. For two or three years I have been raising soy beans and I find them an excellent thing. I inoculated two or three years ago and did not get any nodules. Last year I got some from Washington and they grew well. I think they are a good thing.

PROFESSOR AGEE: We should think more of the guiding principles that must come into our farm practice.

MR. VAN WAGENEN: We will now have the pleasure of hearing Professor Cross.

THE PLACE OF COMMERCIAL FERTILIZERS IN ECONOMIC FARMING

L. J. CROSS,
Professor of Chemistry, Cornell University, Ithaca, N. Y.

I think, from the talk we have had so far today, you know just where the commercial fertilizer should come in. As Professor Agee has told you, the important thing is to get the sod. If you get the sod you have started on the right road. So it will not be necessary for me to develop the subject.

ANNUAL OUTLAY FOR COMMERCIAL FERTILIZERS

I shall speak more on the fertilizer situation, and, if ever there is a time when the farmer should have his eyes open, it is today. I do not suppose I could sell any farmer of Orleans county bogus goods. Why is it that I want to talk to you this afternoon upon keeping your eyes open? Why is there more cause to wake up today than in the past? In 1909 we used $114,883,000 worth of commercial fertilizer in this country. Twenty-eight per cent of the farms in this country use commercial fertilizer, and the average amount of fertilizer used by those farms was $68. In 1909 we had more than double the amount of money spent for fertilizers than was spent ten years before. In 1899 we were using around $48,000,000 worth of fertilizer; in 1909 it jumped up to $114,000,000; and, if we have had the same increase in the last five years, we are today using $170,000,000 worth of commercial fertilizers.

It is estimated that the amount of manure of farm animals that goes to waste — not what is produced, but the amount of manure that goes to waste — runs into the millions of dollars. It has

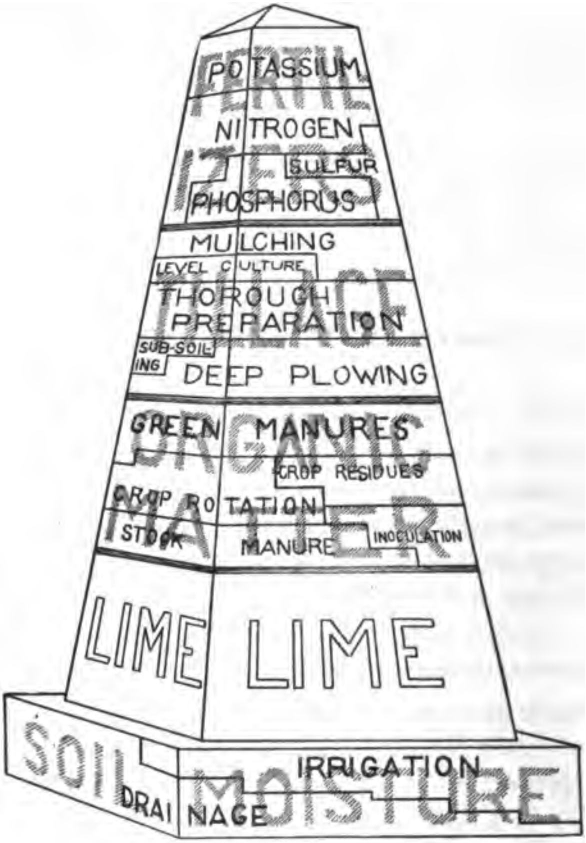

FIG. 516. THIS DIAGRAM REPRESENTS THE ESSENTIAL FACTORS IN A FERTILE SOIL IN THE ORDER IN WHICH THEY SHOULD BE ADJUSTED, BEGINNING AT THE BASE. IT ALSO CALLS ATTENTION TO THE PRIMARY PRACTICES BY WHICH THESE ESSENTIAL FACTORS ARE CONTROLLED.

been estimated that the manure which is thrown away and has been wasted by carelessness, on the American farm, is worth $700,000,000. Now that is good business — throw away the $700,000,000 and spend $170,000,000 for the same elements tied up in a bag! Talk about your conservation problem! You hear a great deal about the conservation of our forests and our mineral resources, and this and that thing. Can you name me a greater conservation problem than that of the fertilizer lost in the manures made by farm animals in the United States?

Today, particularly, we are confronted by certain problems. Potash is cut off; the potash that was in this country when war began is gradually being consumed. Nitrate of soda has not advanced very much in price yet, but common sense will teach any man that, if war continues, the price of nitrate of soda must rise, because nitrate enters largely in the making of explosives.

APPLY FERTILIZER ON SOD

You have heard during the day that there are ways to get nitrogen besides buying it, and if you are to produce that good sod upon your farms you may have some trouble to get it started.

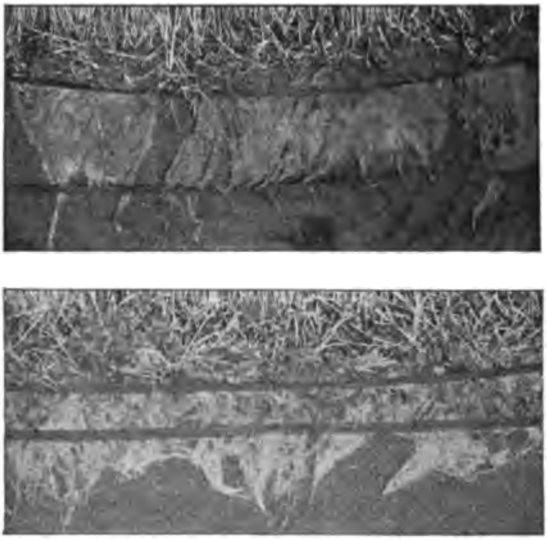

Fig. 517. Root Growth of Timothy. The Upper View Shows the Extent of Roots When Fertilizer Was Applied as a Top-Dressing in the Spring. The Lower View Shows the Growth of Roots When Unfertilized. The Fertilizer Increases the Quantity of Organic Matter from Which Humus May Be Formed.

Here is where the commercial fertilizer comes in. You may have to use it, and you will be getting a better sod year after year. Isn't that much better than the way they are doing in some places? You will use less fertilizer year by year. As the sod becomes better the soil will become better, and you will have to use less fertilizer. Some are just skinning the land. As Dean Bailey says, we are a nation of skinners; we skin our forests and mines and farms and do not think of putting anything back. Where we are using a commercial fertilizer alone, we find we are obliged to use more and more year after year.

There is an analogy in a sick person. Suppose he is taking a patent medicine; he will be obliged to use more and more of it as the system gets poorer. And so with the use of fertilizer: it takes more to bring the seed into action — to produce the same results — than it did when it started. Many of our farmers have the patent medicine habit regarding fertilizer; they buy anything they please just because it is cheap. If they can buy a bottle of patent medicine for seventy-five cents they will buy it, because some doctor's prescription will cost them a dollar. People are buying their fertilizers very often just as they do patent medicines, and they are paying good money for them. I was shocked to know that people right in your section (I do not know whether it was in this county or only in these counties around you) have been buying material that was worth about thirty cents a ton and paying $28 for it.

FERTILIZERS OFTEN CONTAIN BY-PRODUCTS OF LITTLE VALUE

This is a busy world. There is good business in most of the industries. We have good, bright, shrewd business men at the head of our industries, and they put a lot of brains into the selling of goods.

Anyone who has something to sell, if he is shrewd, studies his customer. Salesmanship is a science, and if we are going to sell anything we must study it carefully, and study the customer. Today you know there are many firms studying the farmer as a customer, not only for automobiles, but for fertilizers, and studying them very carefully. Only a short time ago a manufacturer said to me, "We have this by-product. What can we do with it?" And it seems to me that one of the first persons he considers as a customer for his by-product is the farmer. This is the age of by-products. If firms did not sell their by-products a large proportion of them would have to go out of business. Different industries are coming to the point where they are marketing their by-products as the slaughter-houses did for a long time. Armour & Company and Swift & Company have put theirs in such a form as to bring the greatest amount of money. They sell everything; nothing goes to waste. Other concerns, under the financial conditions, have been studying how to market their by-products, because they realize that in them lies their profit.

In the western flour mills there is an enormous amount of dirt which accumulates from the wheat in the course of a year. That dirt used to be thrown away, but where does it go now? They sell it as stock feed and get a good price for it. Can I sell any of you farmers here today a carload of dirt for $35 a ton? You would not buy it. You do buy it in a way, but it is covered up and disguised. So in salesmanship, or in manufacturing these by-products — fixing them up so as to sell them — the proper thing is to disguise them so that the farmer will get them.

AVAILABLE NITROGEN

Here is an analysis on this tag, with seventeen lines on the back. If I can give you the proper impression that this thing is all right you are going to buy it. Why do they put on the top of the tag that the anaysis is made by Dr. Lincoln, of the Rensselaer Institute, who is a well-known chemist? Dr. Lincoln will analyze anything. But on this tag he does not say anything about this. Chemists are very slow to give their estimate of the material; they make the analysis and get their money for doing that. There are three things we should always look for in commercial fertilizers. We want to know not only how much nitrogen is in there, but we want to know something about its availability. And I am sorry that the state of New York does not require them to put anything on the tag to show what it is made of.

I should also like to sell you a carload of dried blood this afternoon, if I could sell it to you at $40. You know it is worth $40, $50 or $60 a ton, if it is all right. The best dried blood Armour puts out analyzes 14 per cent nitrogen. If you think that is too strong in nitrogen, here is a carload of leather scrap that runs 7 per cent. On another track I have a carload of tankage. Which would you take? You take the dried blood, because it decays very quickly, and you know that leather does not decay quickly.

You have plowed under leather boots and cows' heads and plowed them up again, and you know the solubility is low.

So the value of the material depends upon its quickness to decay: the state of New York does not require the manufacturer to tell what the nitrogen comes from. Now with nitrate of soda liable to rise in price, the firms that so far have been honest will be tempted to work in some of this material that is worth less money. If you have a notion in your head that business men are honest and you find them, tie up to them and stick just as tightly as you can. But you will find so much dishonesty and so much tricky advertising, that the more you see of it the more you will begin to wonder — well, you will think those people that talk about the millenium do not know much of the world. There is more bogus material offered today than there has been in the past. We have to take it on faith.

The state requires the manufacturer to guarantee the amount of available phosphoric acid and also the amount of potash, but not nitrogen. New York State is behind some of the other states in its fertilizer legislation.*

A WORTHLESS FERTILIZER AT A HIGH PRICE

Here is a fertilizer that I will sell you for $11 a ton, and the sorry part of it is that the farmer will buy it for $11 instead of buying something that is good. We made analysis of that material and we found that it had no available phosphoric acid, but from goods that were sold here in western New York we were afraid to condemn them on what they sold down in Jersey, because we could not say that it was the same material. We thought they wanted to get in western New York and sell some goods, and therefore would put in honest material. It was sold at $28 in western New York, and I understand they have sold 400 tons of it, and I do not know how much more. Be on the lookout for those things. I sent a letter to Geneva asking them for their opinion, and they said if all the material in it were available it would be worth $7 a ton. I figure that fertilizer is worth about 28 cents a ton, and you buy it for $28.

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* The Legislature of 1915 amended the fertilizer law of New York State requiring the sources of nitrogen.

STUDY EXTRAVAGANT ADVERTISEMENTS INTELLIGENTLY

Here is a fertilizer advertised with a nice stalk of corn — great, long ears of corn — and this is the analysis: "Potassium, 2 per cent; sodium, 1.4 per cent; calcium, 2.97 per cent; magnesium, 3.5 per cent; iron oxide, 7.97 per cent; sulphur, 6 per cent; silicia, 57 per cent; alumina, 15.37 per cent; phosphoric acid, 23/100 of 1 per cent. Terms cash, f. o. b. Boston. Carload lots, $15 a ton; less than carloads, $17. Do not use this fertilizer on any crop less than one ton per acre the first year and one-half ton per acre the second year. Put it all on broadcast and harrow it in and work in this fertilizer."

This is what I want you to look at. I think the farmer does not often read the matter carefully enough. You should read their literature and investigate it just as carefully as you would the lease of a farm or the deed of a piece of property, because if you throw away $28 a ton every year you only delay the time when you buy the automobile.

On the back of the page they quote Dr. Hopkins; they quote Milton Bradley; and they quote Robert Kennedy Duncan, who was the Director of Industrial Research in the University of Pittsburg and the University of Kansas. (Dr. Duncan died recently.) It is all to create an impression. Here the farmers see Dr. Hopkins' name; they see Milton Bradley's name. On this side they see the analysis. If they do not give the matter any closer inspection they may get the wrong impression. But let me read you Dr. Hopkins' testimonial in regard to this fertilizer:

> Agricultural plants consist of ten elements, known as the essential elements of plant food, and not a kernel of corn or grain of wheat, not a leaf of clover or a spear of grass can be produced if the plant fails to secure any one of these ten elements. Some of these are supplied to plants in abundance by natural processes; others are not so provided and must be supplied by the farmer.

Not one word said about the fertilizer. They have cut out one paragraph from Dr. Duncan's bulletin and another one from Dr. Bradley's bulletin, and if they had a chance they would probably cut out two or three verses from the Bible.

Some years ago, when the fertilizer industry was new and farmers had but little experience with commercial fertilizers, we would expect that might be done and we might be buying worthless material; but we regret very much that it is being sold today. You may say, " Does not the government protect us ? " Yes, in a way. The dealers have to obtain a license, and the state takes samples which are analyzed at Geneva, and the analyses published in the Geneva bulletin. If you follow the Geneva bulletin, you will find these goods are below guarantee, and you will be careful about buying them. But all this takes about a year, and it is possible for a firm to get in and sell these goods before the authorities get after them; unless they are held up they can keep on selling them until the ban is placed upon them. No doubt the Department of Agriculture will some day be able to handle that work a little more quickly and there will be some plan for taking care of such cases. But it is very much easier to get around the law than it is to work the honest way.

No matter how good the laws may be, they are liable to be infringed, and your safety depends more upon your keen intelligence and your quick wit and your knowledge of the problem in hand. I should not rely entirely upon the laws of any state to protect me. If you go down and buy soap for sugar, do not blame the state of New York for not protecting you.

STUDY THE ANALYSIS

In this work be careful to observe the analysis. Remember there are only three classes of analysis that you care anything about. If you buy the mixed goods you will be obliged to depend upon the reputation, and you will need to have a good deal of faith and hope that it is all right. There is one way to get around that — buy the raw materials and mix them yourself. If you are using much fertilizer, that is the only way.

In many places we find the mixed goods being sold out of proportion to the cost of the material. I have nothing to say against the honest fertilizer manufacturer. Do not blame the fertilizer agent; very often the fertilizer agent buys worthless material without knowing it, and sells it to you at a small profit of $2 or $3. He does not know any more about the goods than you do. Do not put any faith in what he says unless you know he understands it. I should not put much faith even in a neighbor who was booming a certain brand or a certain spray, unless I knew the man. I know a certain county in the state where one of its leaders is talking a certain spray that is not worth the money they are paying for it, but they have been buying it because he recommended it. They believe now that he is getting that spray at about one-third of what they are paying.

DISCUSSION

QUESTION: Is there a state law against using leather scraps?

PROFESSOR CROSS: There is a clause in the agricultural law that says this: "It shall be considered a misdemeanor to use, in the mixed fertilizers, any inert material." Leather scraps come under that. How are you going to enforce the law? Analysis must be made showing whether or not it is there. Look in the bulletins and see whether it says anything about that. Is there much nitrate of soda used in the mixed goods? Usually they can get a better price for it elsewhere. I do not say but that some is used. Do they use dried blood? It would be rather poor business to use dried blood except in the best grades; it is too expensive. You are not always getting the very best.

And then, years ago, what did they use for filler? Road dust. If you can find out any whim of your customer and satisfy the whim, you will get him. The farmer thinks that a black-looking fertilizer is richer than a light-looking one, and so the fertilizer manufacturers put in foundry sand. Then they found something far better than that. Muck contains about 2 per cent of nitrogen, and that helps out when they fall down on the guarantee. If you want to blame any one particular thing for the high cost of living, it is nitrogen. It is expensive. You show me how to produce, or give me cheap nitrogen, and I can drop the cost of living so low that you will not hear of any trouble.

QUESTION: What is the reason for the price of phosphoric acid?

PROFESSOR CROSS: The price fluctuates a great deal. We have the phosphate rock in this country; we haven't potash, and we haven't nitrate of soda. Feldspar rock can be made into water-soluble potash, but we cannot do it economically and compete with the German salts. We have, on the Pacific coast, a large amount of kelp, and in that kelp there is more potash than we have ever imported from Germany. It will run about 35 to 40 per cent muriate of potash in the dry material, and it is an excellent source. What is the trouble? The trouble is that the Pacific ocean is a poor place for gathering it. The government is working on it and will probably be able to gather it and offer it in competition with the German salts. If the German supply of potash should be shut off entirely, we would have that source available. We have the phosphate rock in this country, but the nitrate of soda we are obliged to import.

QUESTION: Can the potash which we have be made available?

PROFESSOR CROSS: Yes. Many have been using potash and phosphoric acid. It is nonsense to say that a plant does not need potash. But nature, very wisely, has put into the soil more potash than phosphoric acid. Right here in Orleans county you probably have some soils which contain anywhere from 1,200 to 1,500 pounds of potash per acre, a foot thick. The acid phosphate we use contains about 50 per cent of land plaster; that plaster occurs there in the process of manufacture. We make a sulphate of lime and a soluble phosphate. You know land plaster was used years ago. You plastered the corn. As a boy, I have gotten up at three o'clock in the morning for the job of plastering the corn. On some soils, it will liberate potash today just as it did years ago. The reason they stopped was because at that time they had reached the end of the rope.

The potash in the soil is in different stages of solubility. We will say that nature has placed there enough for ten years, and we must have the agencies of nature to make it soluble. We may liberate it by using certain materials, one of which is land plaster. If you have previously used it and have omitted it for five years, you have not the same soil on your land. We have one farmer near Ithaca who uses common salt as a wheat fertilizer. It is not a fertilizer in itself, but he gets good results from it and he swears by it.

Another method is to use lime, which will also liberate potash. You have heard so much today about organic matter that you will probably see it in your sleep. Organic matter allows the soil water to bring into solution more plant food. Plants are babes all their lives; they must take all their food in a liquid condition, and we must bring it into a liquid condition. How does the lime get into our wells? If you sink a well in a limestone region, where there is no organic matter, will that water be soft or hard? You will not have hard water. The more organic matter, the more highly charged the soil water; and if this soil water will dissolve limestone it is reasonable to expect that it will dissolve potash. I should not buy land plaster separately; in some parts of the state it costs $8 a ton.

QUESTION: Are some crops particularly adapted to take up this available potash?

PROFESSOR CROSS: You mean, are some plants higher potash feeders than others? We have no plants that are strong enough to dissolve the potash, but we have plants that are strong potash feeders.

QUESTION: Haven't they the capacity of taking it from the air, which others have not?

PROFESSOR CROSS: No; we have no particular land plant. Some sea plants have the faculty of taking it out of the sea water, but I do not know of any land plant that has that particular property of taking up potash and rendering it soluble. The only factor in the soil to bring it into solution is the carbonated water.

MR. VAN WAGENEN: There is one question of whether or not acid phosphate is costing more this year than it has been. I have gotten it a little cheaper this year than ever before. As a matter of fact, I have no possible interest in selling anybody commercial fertilizer, and will tell you the name of the party selling it to me. The Standard Guano Company, of Baltimore, Md., has agreed to furnish 16 per cent acid phosphate for $8.75 in 200-pound sacks, or $9.25 in 100-pound sacks, f. o. b. Baltimore, and I know of one or two other firms selling close to that price. It is important to know these things, and probably acid phosphate is selling a little lower this year than ever before. If any of you are Grangers you can get your purchasing agent to give you prices as low as that.*

MR. VAN WAGENEN: At this time we are ten minutes late, and Professor Agee will now take up that much discussed and always lively question, "The Functions and Forms of Lime."

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* Since the above statement was made the price of acid phosphate has materially advanced owing to the demand for sulphuric acid (used for liberating the phosphorus) in the manufacture of explosives.

THE FUNCTIONS AND FORMS OF LIME

PROFESSOR ALVA AGEE
State College of Agriculture, New Brunswick, N. J.

There is no other one thing reducing the actual cash income of landowners between the Mississippi river and the Atlantic seaboard in any such degree as is the lime deficiency in our soils. Some of you are wondering if that is so. If it is so, it is a fact of the most profound importance that could be mentioned this afternoon.

LIME IS ESSENTIAL

There may be farmers in Orleans county who own land that never has received any lime application, and that does not yet need lime. If so, happy are they. But the day will come when all of your land will need to receive lime applications, because it is in the nature of things. Lime was placed in soils to keep them in sanitary condition and friendly to plant life. Lime, in effective form for this purpose, is held in the soil very much as sugar would be held. Probably nine acres out of ten have reached a point where lime is so deficient that there lies in the soil acid just as mean as vinegar, limiting the effectiveness of fertilizers. Some of our staple crops will stand a considerable degree of soil acidity; but, when the degree of acidity reaches a certain point, not only the clovers quit, but wheat and oats and corn and timothy fail to grow well. We may reduce the amount of lime in the soil to a point where there will be some limitation in the yield of these staple crops, and yet get half-fair yields. The best part of our income walks right off and we suffer as a result. The worst feature of the matter is that the legumes suffer quickly from soil acidity, and that is one of the reasons that we have the soil fertility problem.

If you believe, as I believe, that most farmers get less from their lands than they should on account of lime deficiency, wouldn't you do as I do, and have done for twenty years — preach lime application in season and out of season, believing that it is a great work to which a man should apply himself? We remove some lime in our crops; a great deal of it is leaching out of the soil. It is our business, when we see land that shows evidences of soil acidity, to do a little bit of missionary work with the owner; then we have not lived in vain and need not be quite so fearful about death.

There is the prejudice against the use of lime on land, due to its irrational use by people in limestone sections, that lime " makes the father rich and the son poor " — that it causes the vegetable matter to burn out. And you and I have had our income limited because some prejudice has crept into our minds that liming is an unnecessary expense and a disagreeable matter.

DETERMINING NEED OF LIME

Many people ask how they may know whether their land needs lime or not. I should say that any man who is able to grow heavy red clover should not spend a cent of money for lime, as a rule. It is true that you should have your soil tested to see whether it is free of acid. If redtop grows much more readily than timothy, and if alsike clover grows much better than medium red, and sorrel grows best of all, we know there is a lime deficiency. Sometimes the owner will say, " Well, I should like to have a chemical test." I tell him to get a few sheets of litmus paper. If a drop of vinegar is put on that paper it will turn

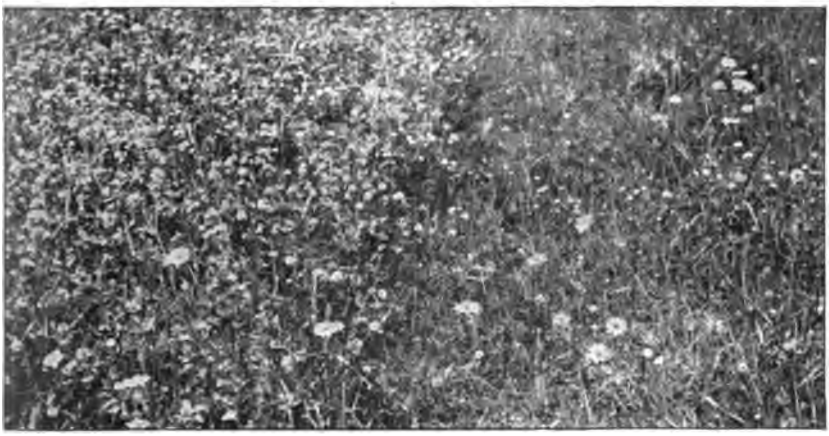
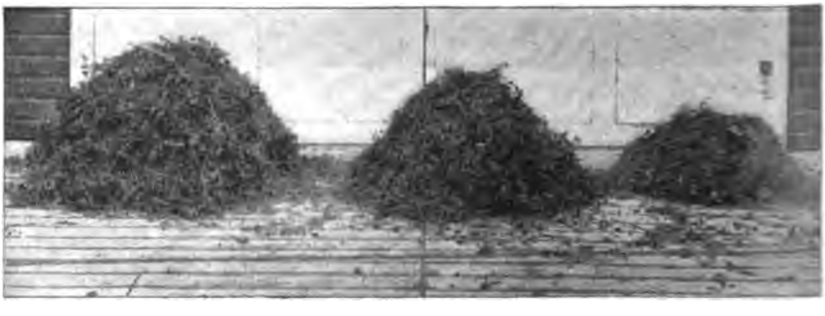


FIG. 518.— EFFECT OF LIME ON THE GROWTH OF CLOVER. BOTH THE LIMED AND THE UNLIMED PLATS WERE SOWN TO CLOVER, BUT VERY LITTLE CLOVER GREW WITHOUT LIME.

pink at once. Take some soil out of the field that is growing sorrel, and if that blue litmus paper turns pink, put on lime; and if it does not turn pink, put on lime anyway. The beauty of it is that it works.

FORMS OF LIME

It is not so much a question today whether soils get into a condition where they need lime, as it is what sort of lime should be applied. Right there you have all manner of confusion, and all because there are interested parties selling the material, and naturally, like good business men, presenting the claims of their goods. The Pennsylvania and Ohio experiment stations, as well as that of New York, have spent much time testing forms of lime and getting results that are dependable. We have learned that if a hundred pounds of limestone are ground as fine as flour and applied to an acid soil, it will correct the acidity just as quickly as you want it corrected, and will correct as much acidity as fifty-six pounds of fresh burnt lime. If you burn absolutely pure limestone you will get fifty-six pounds of builder's lime, as we call it. We take soil so acid that it would take many tons of burnt lime to make it alkaline, and we put pulverized lime upon it to make it alkaline, and the red clover begins to grow. That is enough to satisfy you and me. The question is raised: How fine should the limestone be? I think that depends upon what it costs you, and the size of the application you are going to make. If the first cost of the limestone is large and if there is a freight



PLAT 1 PLAT 2 PLAT 3

FIG. 519.— RELATIVE YIELDS OF HAY FROM A HEAVY CLAY HILL UNDER DIFFERENT TREATMENTS. PLAT 1, LIME 2,000 POUNDS, MANURE 8 TONS PER ACRE; PLAT 2, LIME 1,000 POUNDS PER ACRE; PLAT 3, NO LIME NOR MANURE.

charge for some distance, so that the price at the farm is high, we cannot afford to put on a heavy application, and there will not be enough fine material to do the work at once. In the interest of those baby clover plants, there must be immediate effectiveness.

So I say that when a man is paying a high price for lime the limestone must be finely ground. I bought 130 tons of pulverized limestone for some sour lands we had, and I stipulated that it should all go through a 60-mesh screen. I wanted some of it to lie around and take care of the acidity that would accumulate later; because if you put on only enough to meet the deficiency today, the chances are that a few months later you will find some lime deficiency. On the other hand, to be perfectly fair with you, if there were limestone in my community, and I could buy a limestone pulverizer for a few hundred dollars that would grind it so that it would go through an eight-mesh screen, I should prefer that product. If I had limestone in the community, and used a cheap pulverizer that was not powerful enough to make it all very fine, I should have a product so cheap that I could afford to put on a heavy application. I do not see why we get confused. It seems the simplest business proposition — plain common sense. If I want immediate effectiveness I must have limestone absolutely fine; but because a man sells me his coarsely ground stuff so very cheap that I am willing to put on double the quantity, I will have the same amount of fine material and will have some available lime two or three years hence. I say that it should be very fine if the application is small, but if it is cheap and you want to put on a large quantity, I should not want it so fine. I should expect some of it to leach away.

Then along come our friends who sell hydrated lime — that is, prepared lime — and ask $7 or 8 a ton, or whatever it may be. I like those men because they have gone into communities that have never thought of using lime in any form, and have induced men to use lime, and, while it cost twice as much per acre as it should, the buyer was the richer by using it. Hydrated lime is slaked lime. It is not so strong as the lump lime pulverized.

Hydrated lime is easily distributed, can be applied evenly, and will be more effective because it is evenly distributed. A hydrating plant is costly and, naturally, is placed where limestone is high in quality. Everything is in favor of the hydrated lime, so far as those things go. However, a ton of it cannot correct so much acid as a ton of lump lime. I like pulverized limestone because I can order it when the teams are idle and it can be hauled to the farm and left lying there until I am ready to use it.

Along comes another of our friends. He is selling a lime marl. That is worth just as much as pulverized limestone — perhaps a little more. He will say, "Never use burnt lime; burnt lime burns the humus out of the soil." Nearly every one of them will refer to the Pennsylvania Station for proof. I think I can make one answer to that which will be fairly convincing to you. Dr. Hunt is one of the greatest agronomists this country has produced. He had charge of the Pennsylvania plats for years, studying the results that are so much quoted, and he knew that they did not teach the lesson that marl limestone advocates try to draw from them. He advised the purchase of whatever material would correct the most acidity for a given amount of money. If you continue to apply the lime without any manure, the organic matter will be burnt out; but if only enough lime to correct the acidity is used, and some organic matter made available to lead to larger crops, you will return it ten times over in the clover and in the grass that result from the application of the lime.

Air-slaked lime is good material, but I would not pay any more for it than for very fine limestone.

We use a great deal of oyster shell — carbonate of lime. It is not so fine as the limestone, but has a little plant food in it.

We put the lime on top of the ground; we work it into the top soil before we sow red clover. I do not care if it is two years before. Yields of crops are made somewhat larger and one is that much ahead, and mixing the lime with the soil causes the bacteria to increase. When clover seed is sown, there will be right soil conditions for a good sod. How much lime? It depends upon how sour the soil is. Some land requires less than other. Two tons of pulverized limestone, or 2000 pounds of burned lime, is an average application.

We should not be getting marked results from lime in the orchards if it were not for the legumes. In the case of most staple crops an approach to alkalinity is desirable, and some thrive only in a soil decidedly rich in lime.

DISCUSSION

QUESTION: Any chance of burning?

PROFESSOR AGEE: Unless you have a pretty big bank account, the chances are you will not put on enough burnt lime to cause any damage, especially in Orleans county. If you are putting on only a modest amount do not allow them to sell you stuff that will not make the soil sweet quickly.

QUESTION: What is the least amount of ground limestone to be used?

PROFESSOR AGEE: I have seen men putting in a few hundred pounds with their wheat, and it was amazing how much clover they got. They got a good deal more than they deserved. I should say rather that if land has become so acid that clover has practically ceased, they should apply two tons of pulverized lime per acre. I have seen 200 pounds of fresh burnt lime, drilled in an acid soil, make a crop of red clover. But we generally say to men that it is guess-work. Put on about two tons per acre, but if the soil has been growing clover fairly well, running down at the heel a little, then say a ton. You can tell quite well how far down the line your soil has gone.

QUESTION: Can you tell why red clover does not seed well? *

PROFESSOR AGEE: I should not know just what the matter was. Rains interfere; or, it might be some lack of vitality in the plants.

QUESTION: Will alsike clover stand acidity?

PROFESSOR AGEE: Yes, it will stand a certain degree of acidity. It does not make so much forage as red clover. It is not a genius, but how it hustles to make the most of itself! The most useful citizens we have are the plodders.

Meeting adjourned at 4:50 P. M.

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* Send to Department of Agriculture, Albany, N. Y., for leaflet on "Some Reasons Why Clover Fails."

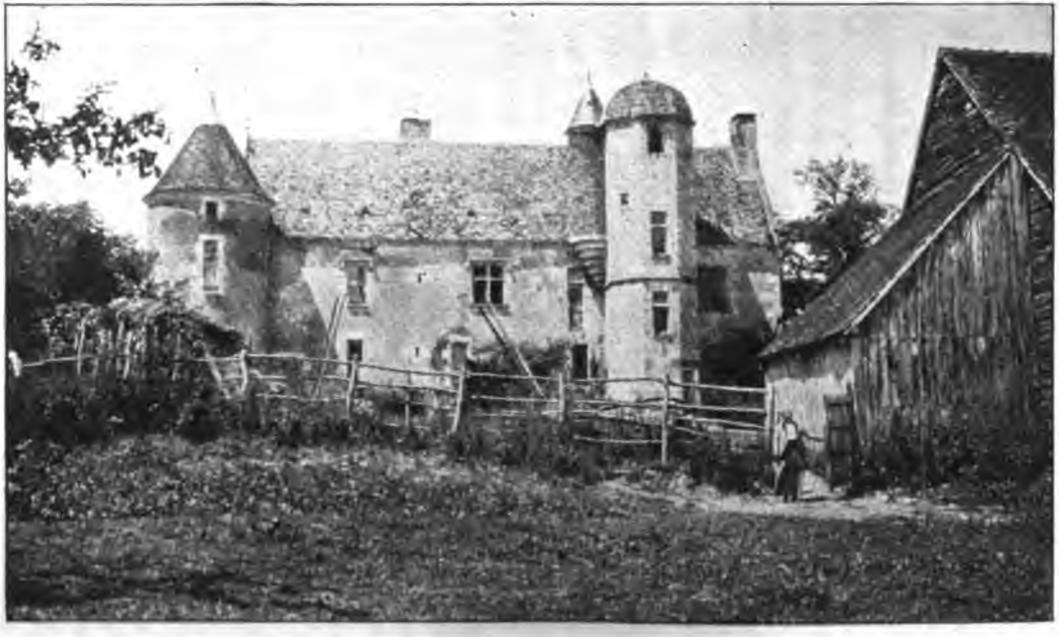


Photo by E. S. Akin.

FIG. 520.—OLD CHATEAU IN THE PERCH DISTRICT WHERE SOME OF THE BEST PERCHERON HORSES HAVE BEEN BRED.

THIRD SESSION

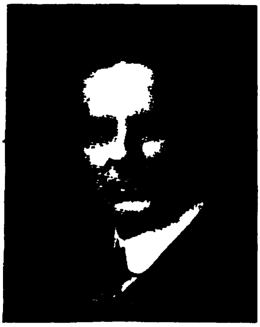
Monday, March 15, 7:35 p. m.

Mr. Van Wagenen: Friends, we have with us tonight, a gentleman who has had a singularly wide experience in the horse business, and a man familiar with the draft-horse business in Europe — especially that part of Europe that is now being ravished by the war — Mr. Akin, of Glens Falls, who will take up the question of horse breeding.

THE HORSE INDUSTRY IN EUROPE

(Illustrated with stereopticon)

E. S. Akin, Glens Falls, N. Y.



I suspect some of you here tonight are wondering why the subject of the draft-horse conditions in Europe should concern the New York State farmer. I can assure you that the present conditions, which are abnormal, will concern us very much in the future. First, the great drain on our horse stock caused by the present European war — probably 150,000 up to January first. This great demand for war horses started in with the cavalry horse and has now changed to gunners' and transport horses, which are being shipped abroad by the thousand. Those horses are the same kind our farmers are buying — 1200- to 1400-pound animals.

But the war tax on our horse stock here is not the largest proposition. The horses that have been destroyed in Europe are not surplus stock, but horses with jobs in the cities and on the farms, and must be replaced after the war. I know the situation there, because I am familiar with the different sections of the different countries where these horses were bred and used. This country and Russia own half the horses in the world. Russia is using up her horses for war purposes. In Germany and Belgium, and especially in France and England, the available horses have been practically used up, or they would not be buying in this country. That demand for horses of the farm and draft class we must expect for the next ten years; and, while it has not yet affected prices

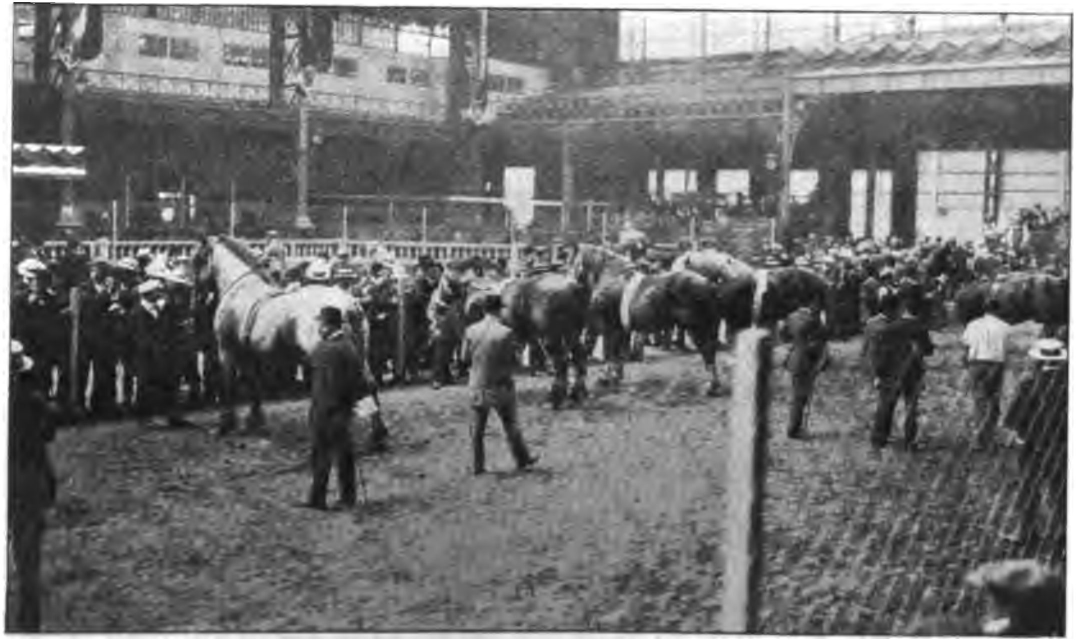


Photo by E. S. Akin.

Fig. 521.—Some of the Prize Winners in the Great Four-Year-Old Class of Belgians at the Government Show at Brussels, June, 1914—the Greatest Draft Horse Show in the World—Nearly 1,000 Entries of One Breed

here materially, it is already being felt in the West to some extent. You can look for much higher prices for horses a year from now.

This state is one of the largest horse-consuming states in the Union, and 95,000 horses are annually brought in or imported from other states. In a way, it will concern us materially how we use the horse-breeding proposition from now on in this state.

HORSE BREEDING IN BELGIUM

As a sort of comparison of what we are doing in this country and what they have done in Europe, in the small territories where the draft horses have been bred for hundreds of years (and on which countries we have depended for our foundation stock), I hope to show you this evening, by comparison of those breeds and the way they are handled there, and the conditions under which they are bred, a little of what could be accomplished here under slightly different conditions.

Photo by E. S. Akin.

FIG. 522.— FOUR BELGIAN MARES OWNED BY MR. RUNSQUIN, WHOSE FARM IS ON THE OLD BATTLE GROUND OF WATERLOO. THE MARE ON THE RIGHT, HEPPE, WAS CHAMPION AT THE GOVERNMENT SHOW, 1912, AS WELL AS THE WINNER OF MANY OTHER PRIZES.

Before the war, Belgium was considered the greatest draft-horse breeding country in the world, according to its size. (It is only the size of Maryland.) Their farms average three acres in that country, and they have the heaviest breed of horses in the world. That does away with the idea that you cannot use a large horse on a small farm.

This year I did not attend the Royal Show in England nor the show in Scotland. I took in the Belgium show at Brussels, the Government show in Paris, and the Percheron Society show at Nogent le Rotrou, France.

The Belgian is the largest draft breed, and the heaviest boned. The weight runs as high as 2,600 pounds, most of the champion horses over there being among the heavier weights.

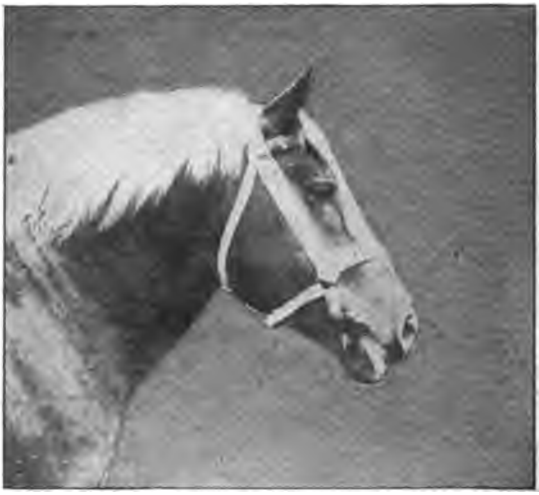


Photo by E. S. Akin.

FIG. 523.— HEAD OF THE GREATEST OF ALL BELGIAN SIRES, INDIGENE DU FOSTEAU, WINNER OF MORE CHAMPIONSHIPS AND PRIZES WITH HIS GET THAN ANY OTHER DRAFT STALLION. SAID TO HAVE BEEN KILLED BY THE GERMANS.

In England there are no laws governing horse breeding. This has been developed by individual effort; a man can have his stallion examined and get a Board of Agriculture certificate. That adds to the value of the horse materially, as it is a guarantee by the government of quality and soundness.

In Belgium it is another proposition entirely. The government, in that little country, spends $350,000 each year for subsidy for their stallions. The yearly inspection is very strict and critical for quality and soundness. The Belgians commence showing their stallions when two years old at their many town horse shows. The best of these go to the county or provincial shows, and finally to the national show at Brussels, which is really a national event. Last June, at this show, there were 1,000 horses — all Belgians.

As the whole of Belgium has bred but this one breed of horses, and they are all interested in their horses, it has been developed to a degree of high quality and value there which it is hard for our people to believe. Some of their mares bring as high as $2,000, and some stallions as high as $25,000. Of course in this country we could not buy that class of stock. To get the high quality, we have to take younger animals.

You could get the same results with the younger animals if you were a judge and would go in a pasture lot and select them carefully, backing up your judgment by knowing the families there that are producers of high-class stock. It is the same thing in horses as in cattle — it is knowing the animal young, in the rough, undeveloped, that will mature to the right quality. If you get a big, rugged horse, he may be a very good worker and still lack many vital things that are very necessary in breeding stock.

The government in Belgium does not own any of the horses or stallions.

FRANCE

It is different in France; the government there owns a large number of all the stallions that are kept for service. There they have a light subsidy, or pension, of $50 to $200 a year.

In France there is only a small section like two or three of our counties which is breeding the horse that we import largely — the Percheron. The Le Perche district is the only part of France from which horses of that breed can be imported.

Of course France has other draft breeds of horses. There is the smaller Belgian horse called the Ardennais, in northern France, which, I am sorry to say, has been in the line of battle for months and is probably nearly destroyed. Besides that there is the black breed of draft horse called the Nivernais, bred in central France; there is the light dapple-gray horse called the Boulonnais, bred near Calais, and there is the Breton horse.

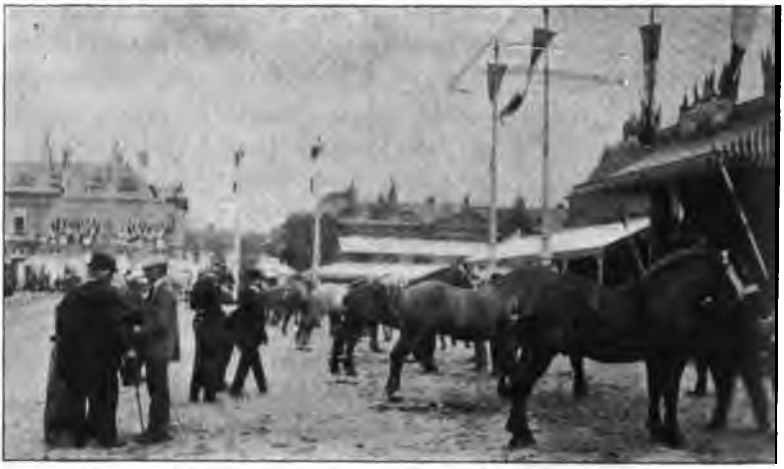


Photo by E. S. Akin.

FIG. 524.— PRIZE WINNERS IN THE THREE-YEAR-OLD PERCHERON STALLION CLASS AT THE GOVERNMENT SHOW IN PARIS, JUNE, 1914, WHERE 1,000 HORSES OF THE VARIOUS FRENCH BREEDS WERE SHOWN.

Of course, in the French Government Show, the largest number of draft horses shown are the Percheron. Another large part of this show are the Demi-Sang, or what we used to call the French Coach horse, which is produced in the country along the coast east from Havre. There are the thoroughbred, half-thoroughbred, the Arab and the half-Arab. All of those crosses have been bred largely in that part of France.

POOR ECONOMY TO BUY BOTH HORSES AND FEED

Our farms here in the United States average about 90 acres. In the sixties they averaged 200 acres. In this state we buy 95,000 horses each year. We also buy most of our meat products and dairy feeds. The United States Secretary of Agriculture has brought that out very strongly in his report, as being economically wrong. He did not mention this state especially, but the southern states instead. It is quite apparent that it is not a good method for any state to buy the larger part of its horses, meats and feeds that can be produced on its own farms at a profit. Greater and cheaper horse power on our farms, with increased production, is certainly worthy of our careful consideration.

ENGLISH AND SCOTCH HORSES

The draft horse of the larger part of England is the English Shire — a horse which is not very popular in this state. They are very large and very heavy boned, and some are considerably marked — white faces and legs. For a horse to win in England, it is necessary to have an immense amount of hair on the legs. A winner over there would be a very unpopular horse here. The English, unlike the French or Belgian people, refuse to cater to the American trade, which calls for clean-legged horses. They say they have the best horse in the world, and we can buy it or not.

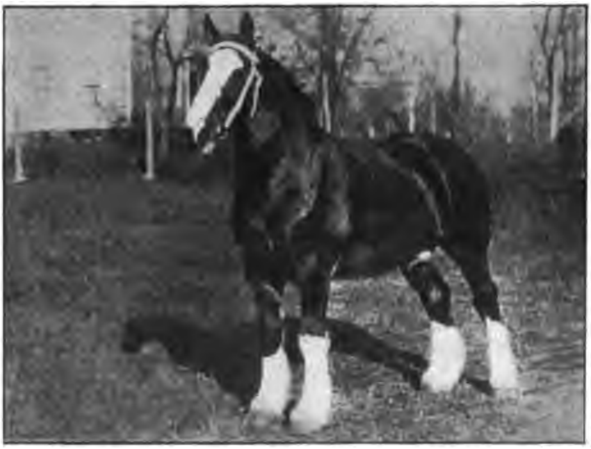


FIG. 525.— SHIRE STALLION, BUCADDEN HEREFORD, CHAMPION AT THE INTERNATIONAL SHOW, 1913.

The Scotch horse, or Clydesdale, is, in coloring and markings, similar to the Shire. It is lighter boned and lighter in weight — very active and very good quality. The Scotch have about the same idea about their horses as their English brothers. The Scotch horse has been very popular in Canada and some of the western states, and also in New Jersey, but not very popular in New York State.

Another English horse of the draft breed is the Suffolk. This is raised in one county, Suffolk, which is on the east coast of England, just across the English channel from Belgium. They are very clean-legged and of one color, chestnut, and weigh about

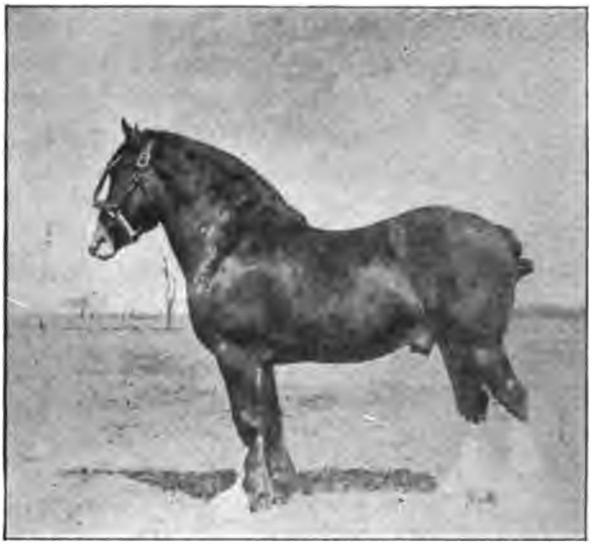


FIG. 526.— CLYDESDALE STALLION, GERTLY PRIDE, PRIZE-WINNER IN SCOTLAND, OTTAWA, TORONTO, NEW YORK AND CHICAGO.

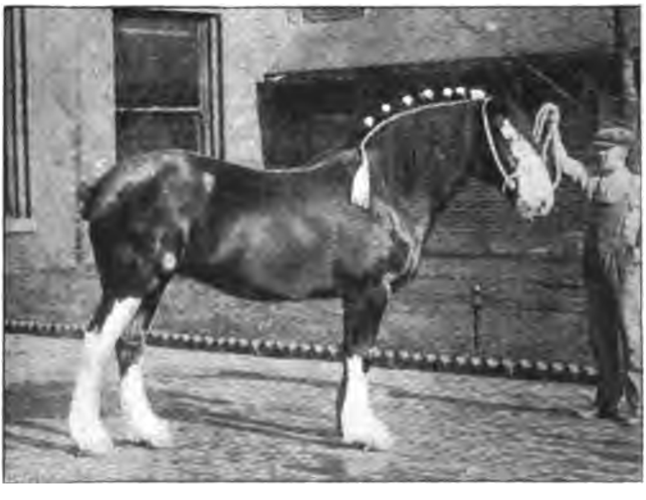


FIG. 527.— CLYDESDALE MARE, HARVESTOUN BARONESS. CHAMPION MARE IN SCOTLAND, 1912. OWNED BY FAIRHOLME FARMS, NEWMARKET, N. J.

1,500 to 1,800 pounds. There are a few of the larger type weighing as much as a ton. They are very popular in Australia and Austria, and several have been sent to Russia and to this country, and some to Canada. Unfortunately, they are somewhat few in number. If a man wished to buy, as I often have in France, two or three carloads at a time, he would have trouble in finding so large a number of animals of high quality. I have had very good success in buying only ten to fifteen Suffolks in England at one time. The price of the Suffolk runs a little higher than the other breeds. It is a lighter-boned horse, fully as good and perhaps better for agricultural purposes than any of the draft breeds.

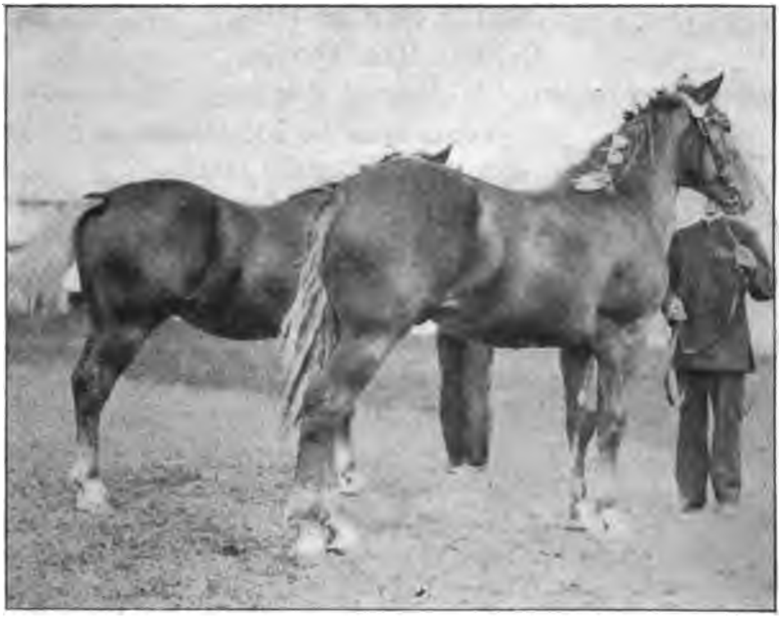


FIG. 528.— SUFFOLK STALLIONS, BOWDSEY SAFFRON AND BOWDSEY AMBER, ONE-YEAR-OLD WINNERS OF FOUR PRIZES AND CHAMPIONSHIP AT THE NEW YORK STATE FAIR, 1914. SELECTED IN ENGLAND BY E. S. AKIN, GLENS FALLS, N. Y.

(At this point some fifty illustrated slides were shown, principally of champion stallions and mares of the Suffolk, Belgian and Percheron breeds, together with a few illustrations of noted

Clydesdales and English Shires. As each picture was shown, Mr. Akin gave a brief history of the animal.)

Mr. VAN WAGENEN: I am very glad to have with us tonight Dr. Dexter, who will now talk to us.

BETTER COUNTRY LIFE

DR. WM. HART DEXTER,
Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C.

Let us think for a little while of the subject, "Better Country Life."

The justification for such a subject may be found in the coat of arms of the Empire State, across which we read the word "Excelsior," which teaches us to look up. However good anything is already in New York State, we are always hoping to have it better. However high we have already climbed, we try to climb a little higher. However good our country life is now, we are willing, as men with open minds and open eyes, looking the facts squarely in the face, to consider if there may possibly be better country life. That is the very suggestion of our state coat of arms.

I want to take another suggestion from the state of Iowa. Out in Iowa they print the best agricultural weekly in the world, run by "Uncle Henry," as his friends and admirers familiarly call him, and across the front page of "Wallace's Farmer" you read the motto, "Better business, better living, better thinking." That is a good motto with which to start our meeting tonight. There must be a basis on which to build better country life, and that is the better business of better farming. The average farmer of this state earns the wages of a first-class hired man, and that is all he earns; he does not earn any pay for management.

BETTER BUSINESS

There is need of farmers' institutes and extension schools and agricultural newspapers, and every other means that can be encouraged to make a better business of better farming in New York

State. We want farming that will give us the five essentials of good farming:

1. Maximum production for the entire farm.
2. Maximum profit to be made from that production.
3. Increased productiveness of the farm while we are getting the big crops.
4. Maintenance of the farm family at the high standard of country life.
5. Contribution of a fair share to the improvement of the farming community.

Those five results tell us whether we are doing good farming or not. The average agriculture of this state is, of course, not the agriculture of the people who are here tonight, for many of the average farmers do not come to these gatherings. But let us realize, from the figures and from what we know of the fortunes and misfortunes of the farmers of this state, that for better country life we must have the foundation of better farming, especially on the business side. Only out of the profits of profitable agriculture can we get the finish — the conveniences — the better equipment — the luxuries — which we want in better country life. Then, if we are to have these better things, we must have better farming with which to secure them. That is the basement story — that is the foundation of whatever structure we might have of country life.

BETTER LIVING

Now take Uncle Henry's second item, better living. Let us think of the better living conditions in country homes. For if we are to have better country life we must build, as the first story of our structure over the basement already mentioned, the domestic story — the life in the home; and for that, if it is to be better, we want better equipment. We want better living conditions in the interest of the children, especially. We that are older can stand the present conditions as long as we are likely to last. But we want our boys and girls to have better conditions in country homes. Perhaps a sanitary bathroom ought to be spoken of. I would like also to speak of music in country home, but Mrs. Morgan will speak of that; so that part of my speech you can look forward to tomorrow.

BETTER THINKING

Uncle Henry's third point is better thinking. Here again, if we are to be sensible, we shall not say very much about what the older people think. I noticed on the new state roads here this last week that somebody had posted signs which read, "Do not drive in the middle of the road," and "Do not drive in the ruts." Our ideas run in ruts, mostly. You cannot teach an old dog new tricks. But we can hope for some better things for our boys and girls.

How shall our boys and girls learn to do better thinking than we have done? Naturally, we have to say, by enjoying the privileges and using the advantages of better country schools. That is the particular aspect of this question that appeals to me tonight. We have better schools than the average school, but the average school has one room and one teacher for all grades — the country school of our grandfathers — and that will not do today.

CONSOLIDATED SCHOOLS

Down in Delaware county, where we had institutes, we were twice in the school where the Department of Education was accepting the new buildings for consolidated country schools. I present to you the consolidated school for our country boys and girls. It is already a successful advance on methods of education in at least thirty-three of the states of this Union; and the laws of our state now provide that we too may have the advantages of the consolidated country school. It brings together four, five, six, ten of those old-fashioned district schools, and organizes, at the community centre of such section, the consolidated school with its modern building, with its modern equipment, with its orderly and economical grouping of teachers and methods, so that the school may do for our boys and girls what they are entitled to have done for them in country schools.

WHAT A PRACTICAL EDUCATION SHOULD DO

There seem to me to be lacking three subjects that ought to be added to the course of study generally followed in our country schools, and these additional subjects can be and are being handled.

in the consolidated country schools for which our laws now provide. Let me give you a home-made definition of what practical education ought to do for our boys and girls. A satisfactory education should train our boys and girls to be and to think and to do what they will need to be and to think and do when they come to be men and women. If that is a fair definition of what education should do for our boys and girls, we may ask, Are our country schools giving our boys and girls such an education? All our boys and girls are going to need to use their hands. Does the average country school teach manual training? Three-fourths of our boys will live on farms. Do our country schools now teach scientific agriculture? Some of them do; more of them will. Our girls will make and manage homes. Do our country schools teach home economics? In our consolidated school we can have these; and these, carried up through the years of high-school work, will give our boys and girls the education they are entitled to have in their own home community.

BETTER SOCIAL CONDITIONS

Let us go a little beyond Uncle Henry's motto. When we look out through the windows of this country home to the other side of the highway and across the line fences, we see that there are other farm homes, other boys and girls, and other men and women in the country community, and we realize that it is not well for man to live alone — it is not possible for man to live alone. We realize also that it is from a lack of desirable social conditions that many of us are inclined to leave the farm and go to town. If you ask people why they have given up country life and have gone to town, they will say they want more money, better school privileges for their children, and better social conditions for themselves and the young people. Why not have the best social conditions in the country? Have we not made a mistake by supposing the best society is in the city?

Possibly you noticed, ten days ago, what President Wilson said about high society, and how it could be spared from the world and never be missed, and other things to that effect. It is not necessary that our young boys and girls should go to town to enjoy social privileges, provided we do our share towards the encouragement of such recreation, such music, and such play and games for the young people — for the boys and girls — as they are entitled to have in their own country community.

IMPORTANCE OF ORGANIZED PLAY

I speak for play for the boys and girls on the farm. They will play. Play is just as necessary for boys and girls as eating and sleeping. God meant young people to play. No girl becomes a perfectly normal woman by omitting it. Play is not only necessary, but it builds character — more than schoolrooms do. A boy does more to determine the qualities of his manhood on the playground than he does in the schoolroom. In the schoolroom he reads about some big men, but on the playground he plays the game according to the rules or tries to beat the rules; and by the way he decides to do what he does, he establishes those moral choices that come to constitute the characteristics of his manhood. He does not do that in the schoolroom.

Notice a game of football. The first thing a young lad learns when he is taken on the squad is that he must be temperate; then he must listen for signals that are meant for orders for him, and when he hears them he must obey without stopping to ask if it will not do a little while later. If he is asked to guard the goal when he might grab the ball and make a run down the field, does he grab the ball and make that play? He does not. He guards the goal and someone else gets the applause. He obeys the orders, that the plan of the campaign and the efficiency of the team may win — loyal to the team. For the lack of those qualities of manhood the American farmer will fail.

They say Waterloo was won at Eton, and there is a good deal of sense in that. On the playground our boys may or may not get the right qualities, depending upon whether we encourage the right kinds of play and give our sympathetic interest to the development of such kinds of games and sports as will be good for our boys. The same principles apply to play for girls.

I do not see why the young man, or the big boy on the farm, should think that he must go to town to have a good time. Do you know the kind of time the big boy has when he goes to town? I should hate to tell you. Some of the doctors can tell you. You can read it sometimes in the faces of the third and fourth generation. If the minister is too busy with the spiritual concerns of his people to give attention to the affairs of his young folks, the devil will find time to take a hand; and if amusements are not encouraged from above, they will be encouraged from below. It is a mighty important matter.

Our Lord was not above making a social success of a function that would have been a failure without his assistance. I doubt if any of his followers can justify themselves in being better than their Lord. Children were no strangers to his knees or to his hands; they were not afraid and did not run away when he called.

THE RELIGIOUS SIDE OF COUNTRY LIFE

There is just one other department of interest. We have spoken of the industrial; we have spoken of the domestic; we have spoken of the educational; we have spoken of the social. There remains the religious side of country life. Shall we say we need a better religion in the country for better country life? Is that to be construed as some new religion? (They say we have a new religion in American every day in the year — a wonderful country for new religions.) No; surely not, friends. Simply that we shall perceive things religious as they are and ought to be; simply that we shall read the Old Book more carefully and appreciate what it really means — that we shall catch the spirit that pervades it from the point where it begins by saying, "In the beginning God," to the point where it ends with a picture of glorified humanity in such perfect social relations that all are glad.

The better religion for country life will illustrate more accurately the real spirit of the Lord. The better religion of better country life will remember that he said that the Son of Man had come to minister and give his life. The better religion of country life will remember that he said, "The Son of Man has come to seek and to save that which was lost"; that he said, "They that are whole need not a physician, but they that are sick"; that "The poor ye have always with you." The better religion of better country life will remember that he said, "I must work the works of him that sent me," and, "Work while it is day." When two ambitious young men of religious disposition came to ask him who should be greatest in his kingdom, he told them practically that he should be greatest who rendered greatest service. When he pictured the destruction of the house built upon the sand, against which the wind and the rain beat, and great was the fall of it, he explained that it represented him who "heareth these sayings of mine and doeth them not."

Friends, have we standardized the methods of the country church on the wishes of the well-to-do and established farmer who pays a liberal part of the minister's salary? Had we not better standardize it on the needs of the hired man and tenant farmer and the boy of thirteen? Would not that help towards the better religion for the better country life?

Now, friends, these things taken together are the factors which give us the product of better country life; this better business of better farming with a larger margin; this better equipment of the country home with its better living conditions; this organization of the country school with its providing for our children that to which they are entitled; this study of better social relations, so that our boys and girls shall have, in and about their own homes, the play and recreation and amusement to which they are entitled; this study and illustration of the truth as it is seen in the measure of the stature of the fullness of the Master — these things will constitute, in and around our homes, the country community which will be the place where the better country life will be surely developed.

FOURTH SESSION

TUESDAY, MARCH 16, 10:00 A. M.

THE HORSE FOR THE NEW YORK STATE FARMER*

E. S. AKIN, GLENS FALLS, N. Y.

THE MAGNITUDE OF THE HORSE INDUSTRY

Before we can make an improvement of the horse-breeding conditions in this country, I believe we should understand more fully the magnitude and importance of this industry and the close relation the horse bears to the welfare and prosperity, not only of the farmer, but of the nation and of each individual.

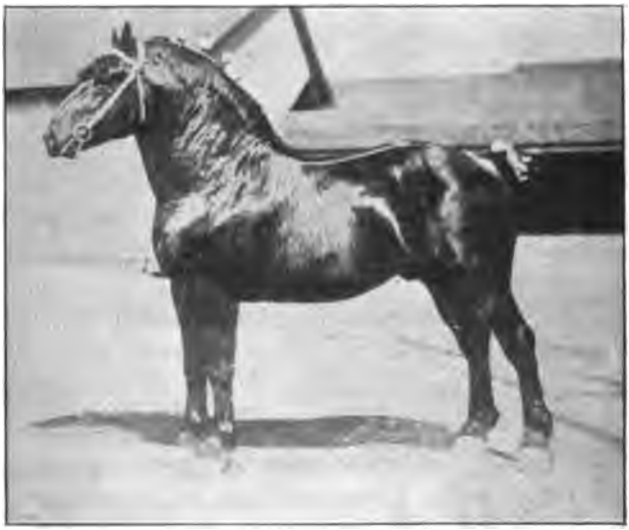


FIG. 529.— PERCHERON STALLION, ILDEFONSE, CHAMPION AT THE INTERNATIONAL SHOW, 1913. OWNED BY HEART'S DELIGHT FARM, CHAZY, N. Y.

Horse power and horse efficiency on our farms are of much more importance to us than the tariff, and as compared to transportation handled by the combined railroad and steamship lines of this country, which is 15 per cent, the horse handles over 83 per cent and the motor truck and tractor less than 2 per cent.

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* Send for the bulletin entitled "The Horse Industry in the State of New York," published by the Department of Agriculture, Albany, N. Y.

And right here the horse power efficiency in this country looms up big as a factor in our high-cost-of-living problem. There are about 22,000,000 horses in the United States, an increase of about 10 per cent in the last ten years, with also a very substantial increase in value. The present horse stock in the United States represents considerably more than the combined value of the cattle, sheep, swine and poultry of this country. Both the increase of 10 per cent in the number and the increase in value have come in the face of the automobile, which has replaced thousands of light horses. We all agree on the fact that the automobile is with us to stay and that we cannot in the future make light horse breeding profitable, except to a very limited extent. This brings us down to the question of the surest source of horse power and profit for the average farmer.

While it is true that no class or breed of horses has escaped use for all purposes, farm conditions today call for draft horses. Our average crops per acre are away below those of many foreign countries, where intensive farming is practiced largely and is possible only with the large number of draft horses bred on their own farms.

Draft horses and farm machinery make intensive cultivation, increased production and increased profit possible on the average farm in the United States.

LAND VALUES INCREASE WITH HORSE BREEDING

If we are to make an honest effort to remedy some of our mistakes and omissions in horse breeding, we must study present conditions and possibilities, not from a personal standpoint, but as a broad business proposition of increased production of animals, size, quality, and higher values. My study of draft horse breeding in the middle West and in European countries has shown me that the prosperity of the farmer in increased land values, crops, live stock, farm wealth, and consequent commercial manufacturing and industrial prosperity has closely followed the development of the draft horse industry.

Take, for example, Iowa, our greatest horse breeding state, where nearly one-half of her farmers are draft horse breeders. Not many years ago, land values in Iowa were very low; today

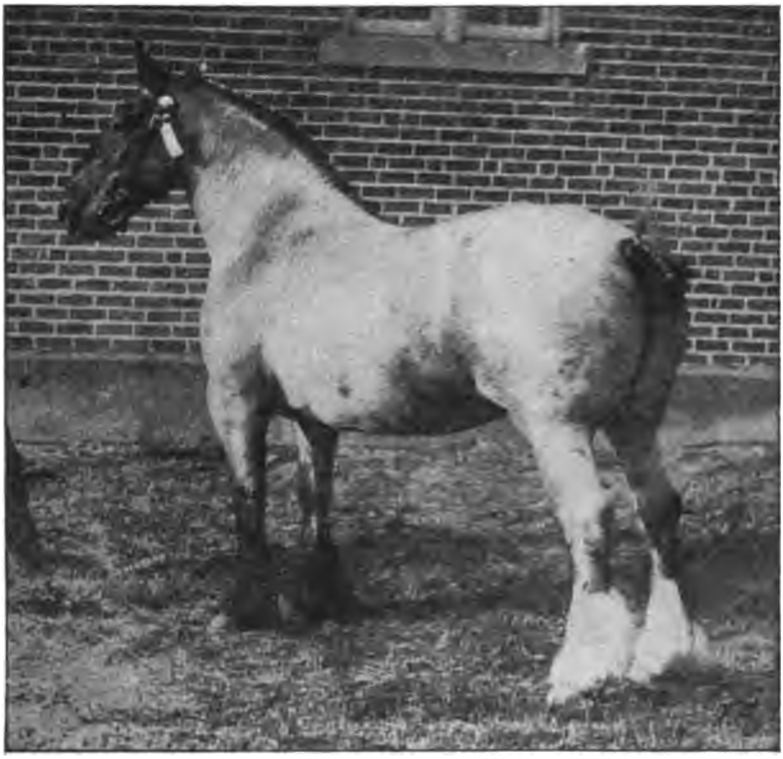

FIG. 530.— SHIRE MARE, CALDHAM SURPRISE, CHAMPION AT THE IOWA STATE FAIR, 1914.

her land is valued at $200, $250, and in some cases even $300 per acre. This is true in proportion to their horse breeding activities of all of the middle western states.

Of all the European countries I can class Belgium as first in the quality and values of her horse industry — not as she is now, ruined and destroyed by the invasion of Germany, but as she was when I was there last July. This little country is about the size of the state of Maryland, but with 7,500,000 population — 6,000,000 more than Maryland. In imports and exports she stands sixth among the nations of the world. Good farm land is worth $800 per acre. Intensive farming is the rule, not the exception, and the immense crops are sources of wonder to Americans. Here one breed of draft horses means community breeding in theory and practice. Individual effort, backed by government stallion laws, inspection, and encouragement, has produced a breed of horses and a consequent demand for them that astonishes the world.

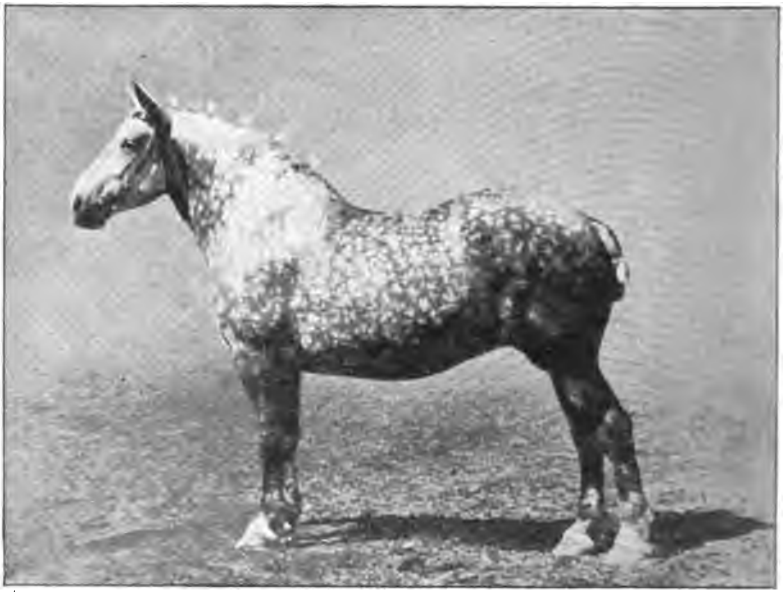

FIG. 531.— PERCHERON MARE, HERMINE, CHAMPION AT IOWA STATE FAIR, 1914.

WHERE INTENSIVE BREEDING IS DONE

The Belgian Government spends $350,000 each year in stallion pensions and prizes for the encouragement of draft horse breeders. At Brussels there is held each year the largest draft horse show in the world; over 1,000 horses, all Belgians, were at this show last June. This show is a national event; and men who by their foresight, judgment and enterprise have made possible the great improvement in the Belgian horse during the past twenty years are looked upon as public benefactors. To the Belgian horse all the other draft horses owe their origin, and this is the only country in the world where money would not buy their best breeding stock. I have seen noted Belgian stallions change hands at from $10,000 to $26,000 — not for export, but to stay in Belgium. If by the disaster of the present war this great breed of horses has been destroyed and ruined, as now seems certain, I should consider it the greatest disaster to the horse breeding interests of the entire world that has ever happened.

Each year we have sent to France between one and two million dollars for Percheron horses, mostly stallions. This money goes to the breeder of the Perch district, a small section of country in central France — another very striking example of the benefits of community breeding, stallion inspection law, and combined as well as individual effort to produce the best draft horses in the world.

It is a fact not generally known that the small farms of Europe are the breeders of the greater part of all of the pure-bred draft horses of the various breeds. Most of the noted men you hear of abroad as connected with draft horse industry in a large way are only dealers, depending for their large stock on the small farmer who keeps one or two tested brood mares and sells the colts at weaning time each fall. Most of the best stallions and mares are being bred on farms of only a few acres in a thickly populated country, largely by tenant farmers whose capital invested is represented principally by one or two mares. Intensive horse breeding in Europe is necessary, as, with the limited means of production, the income from the few mares must be large and certain.

FUTURE CONDITIONS

I do not wish to pose as a prophet as to the future of the horse breeding industry in the United States, but certain facts and present market conditions affecting breeding stock stand out so prominently that any man who considers the situation carefully can anticipate the future correctly.

The twelve states of the Middle West that supply all of the middle, eastern, and southern states with horses have reached their maximum limit of production. Located as it is in the heart of our best horse breeding country, only ten per cent of the horses that go on the Chicago market weigh over 1,500 pounds, which means many buyers for few horses.

Another condition which we should consider now, and one which we must face later, is the effect the present great European war will have on our horse supply and values. You perhaps remember the clean-up of the cheap, small horses for the South

African Boer War, and the sharp advance in price of all classes of horses following. This promises to be duplicated on a larger scale. The large accumulation of small horses suitable for cavalry purposes, which are largely misfits from trotting, saddle, and coach horse breeding, are being shipped abroad by English and French buyers in enormous numbers. These are principally cheap horses made so by carelessness in breeding and indifference in raising, and are being replaced largely by the auto. Any horse is too good to be used as a target for a cannon, but the demands of war are imperative, and our markets are being cleaned up and millions of dollars are coming to this country for horses, the marketing of which seems to require the misfortunes of war.

It seems hardly credible, but we are told that the life of the ordinary cavalry horse on the firing line is less than ten days. This must be true, as England and France seems to have used up great numbers of their wonderful thoroughbreds and hunters and their crosses, besides clearing these countries of nearly all driving and saddle horses, as well as draft geldings of all kinds. Already, in some parts of England, farmers are using oxen on their farms. The English government is considering the proposition of subsidizing horse breeding. Germany is taking any horses she can get from Denmark at $500 each, which is double the original value.

Beyond all demands on our horse supply caused by this war, after peace is declared I believe we must expect a greater drain on our horse stock than has ever been known, in replacing the farm horses destroyed in England, Belgium, France, and Germany and probably other countries that have furnished horses for the combatants.

I am calling your attention to these conditions because I believe the time has come when the farmers of this state must produce their own horses or pay prices in the near future as yet unheard of, high as prices seem today. Unlike any other class of stock, horse breeding operations begun now will not give you work or sale animals for five years. The first great problem is to change 80 per cent of our farmers from horse buyers to horse breeders. To those of us who can read the signs of the times, a change for the better in the present condition seems possible in this state. This I can see by the growing and insistent demand for larger, better farm mares; this demand gives us hope for a still greater change in the near future. For years geldings have been shipped to this state by the thousands, and dealers could buy them cheaper and in larger numbers. Western farmers were willing to sell their surplus geldings, but with mares it was quite a different matter. Dealers are now facing this new feature of the trade which they must prepare to meet, or lose a large part of their sales to the farmers.

THE VALUE OF STALLION INSPECTION LAWS

Stallion inspection laws, which have proven to be so beneficial in Europe and have raised the standard of horse breeding in many of our western and eastern states, would greatly benefit New York State. Many unsound and cull stallions that could not be sold elsewhere have been sold in this state; and, until we appreciate more fully the necessity of keeping only the very best sound draft sires and eliminating the scrubs and unsound stallions, there is small chance of the state-wide improvement which is so necessary and possible.

COMMUNITY BREEDING

Company ownership of stallions has been tried in this state, but with little success, as most of these stallions sold were of low quality and of little value except to the seller. The principle of cooperative breeding is good. It is practiced largely in Scotland, where farmers combine and hire stallions for the season. Usually a certain number of mares are guaranteed at a certain fee per mare. Community breeding has made possible all of the great European breeds of live stock, and the advantages of a single breed or type of animal in a certain section are many. I have in mind one county in Indiana where sixty high-class Belgian stallions have been kept for years. This county has a reputation for good horses; and, although prices are high, buyers go there from many states, as they feel sure of buying a good carload of horses with little expense and trouble at any time. Community breeding could be made possible by town and county organization. Our state organization, the New York State Draft

Horse Breeders' Club, is doing good work in a broad-minded unselfish way, working for the betterment of the horse breeding industry for the entire state. This get-together plan is not a new one; you can see it practiced in nearly every line of business endeavor in this country. Probably one of the greatest factors of strength of the German nation today is the perfect organization of business which the government encourages.

To those men of this state who in years past have, by their investment in pure-bred draft horses, made improvements of the horse stock in their section possible, great credit is due; but the spirit of "get apart and fight one another" was common. This pull-together idea among the draft horse breeders of this state will assure greater improvement of horse breeding conditions in this state than can be accomplished by individual effort. It is unfortunate that the importation of draft stallions and mares from Europe has been checked, as for many years to come we could well use the high quality of animals that importers have been bringing over.

SUPERIORITY OF IMPORTED STOCK

We need the best draft breeding stock that we can get, regardless of where it was bred. The fact that we have been importing better stock than we breed at home is apparent in the show ring, as ninety per cent of the champions and prize winners at our big shows are imported animals. The reason for this is, first, the government behind the horse; second, the best draft horses in Europe are not bred by chance or luck. Certain blood lines have been handed down for generations from father to son. Their pride in and love for their horses are inherited as much as is their instinct in feeding, developing, and showing. Their pastures surpass any I ever saw in America. Years of patient work in study and selection by men who have devoted their lives to this work have made the Percheron, Belgian, Shire, Suffolk, and Clydesdale horses famous the world over. What America owes Europe for our foundation draft horse stock can never be reckoned in money.

I do not wish to disparage the efforts of any men in breeding registered draft horses in this country; many have accomplished great results. But I do say that until the average farmer discriminates more closely between the good, bad and indifferent sires and dams, and applies more liberal methods of feeding and better pastures, we shall still fall far short of the good we should accomplish.

In any of the horse countries of Europe I never heard anything about the boy leaving the farm. I always found the boy right there with the horses; in fact, the whole family were interested in the horse business. I believe there is no surer way to make farm life attractive to our boys than to put on our farms a few pure-bred draft mares or colts. They will become interested in breeding, growing, working and selling these big draft animals. When a boy is pleased, satisfied and making money, he will seldom leave the farm. It is to the young men and boys, more than to their elders, that I believe we may look to change horse breeding conditions in this state, and to these future horse breeders we should give every encouragement.

NEW YORK IS DOING MUCH TO ADVANCE HORSE BREEDING

Prominent writers have prepared articles for agricultural papers, and by these much good work has been accomplished directly towards better horses, as well as by institute speakers, the State Breeders' Association, and our State Fair, of which I am very proud.

At the last New York State Fair nearly seven thousand dollars in prizes was offered for farm and draft animals, besides seven gold medals, three silver trophies, and ten silver medals offered by the Percheron Society of America. There were offered besides these, two silver cups as New York State Draft Horse Breeders' Club specials for weaning colt classes, bred and owned in New York State, and also eight gold medals which I interested the Belgian Government in donating for the Champion classes of the Belgian breed. Ours is the only state fair in this country where the Belgian Government offered special prizes.

This liberal premium list, one of the largest in the United States, brought out 368 entries. The quality of this exhibit, and the fact that every animal shown was owned in New York state, was one of the most encouraging signs of the revival of the horse

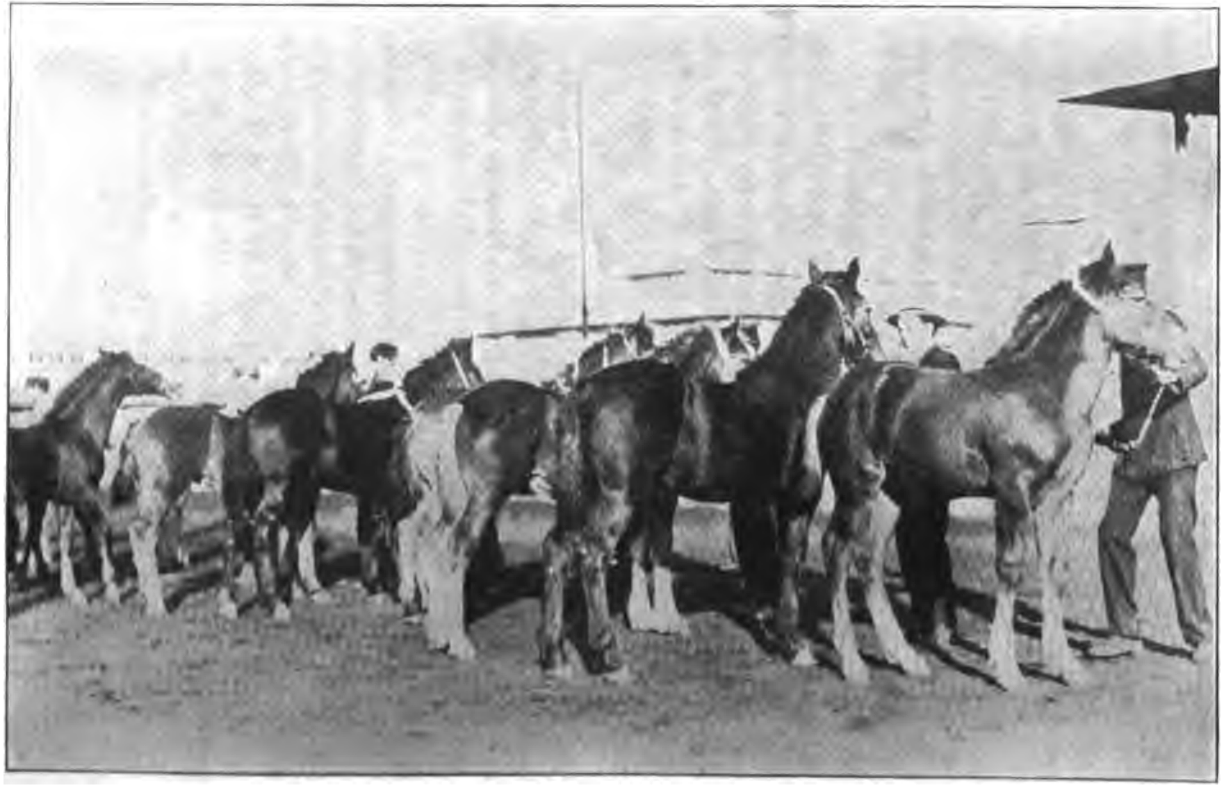

FIG. 532.—NINE REGISTERED PERCHERON AND BELGIAN WEANLING COLTS, BRED AND OWNED IN NEW YORK STATE. SHOWING IN NEW YORK STATE DRAFT HORSE BREEDERS' CLUB SPECIAL FOR SILVER CUP OFFERED BY E. S. AKIN. ONE OF THE MOST INTERESTING CLASSES IN THE FARM AND DRAFT HORSE DEPARTMENT OF NEW YORK STATE FAIR, 1914

breeding interests in this state that I have seen in years. I can also report progress all down the line. Two international champion stallions, the highest priced draft stallions ever sold in the United States, are now owned in this state. By cooperative buying, two hundred stallions and mares were imported from England, Scotland, Belgium, and France direct to the farmers in this state in the past two years, at a saving of at least thirty thousand dollars. There have been nearly one hundred home-bred stallions and mares sold, and around one hundred and fifty pure-bred draft colts raised in this state during the past year. Some of these colts have already been sold at from $300 to $500 each. This demand for pure-bred stallions and mares is the best in years and is increasing steadily.

AN OPPORTUNITY FOR YOUNG FARMERS

To many young farmers in this state I can recommend pure-bred draft mares as a source of greater profit, satisfaction and success. This means starting at the top with a tested breed that will produce certain results. If pure-bred mares are too expensive, you can reach the same end by buying weanlings or yearling fillies at about $250, the price of a work horse. In this way it is easy to get on an intensive footing with as many mares as may be desired. For the average eastern farmer we must depend on a greater number of the best sires to use with our common mares in grading up. Many farmers in this state who are using geldings are finding them too expensive for farm work, and are changing to good grade or pure-bred mares. As a business proposition in adding to your farm production and profit, I can advise, more strongly than at any other time, the draft horse breeding — at least to supply your own farm requirements.

QUESTIONS

I have been asked the following questions:

"Why do you advise the farmers of New York State to breed heavy draft horses?" It is because we need them for more power and production on our farms, also for profit. The cities of this state employ 300,000 horses, one-third more than in the cities of any other state. The larger horses cost $300 each or more.

None are raised in New York State. These can be raised at a profit of $125 each. Pure-bred draft stallions and mares can be bred and sold at $500 each, a profit of $325. It is simply up to us to raise the horse the market demands.

"What does it cost to raise a light or heavy horse to maturity?" Of the 95,000 horses purchased in this state yearly, 20 per cent are under 1,200 pounds; 70 per cent medium — from 1,200 to 1,500 pounds; and 10 per cent heavy — 1,500 pounds and up. Cost (estimated) light, $145; medium, $160; heavy, $175. Up to three years old, when they can earn their keep, the average selling prices — light, 1,000 pounds, $140 — loss $5; medium, 1,300 pounds, $200 — profit $40; heavy, 1,600 pounds, $300 — profit $125.

Fig. 533.— Yearling Belgian Filly Class, New York State Fair, 1914. First Two Fillies Selected by E. S. Akin.

"What breed of draft horses is the best?" There is no one breed of draft horses that has a monopoly of all the good qualities. Each breed has its admirers and staunch advocates. Of nearly 200 head of draft stallions and mares which I have imported in the past two years, about 7 per cent were Clydesdales, 18 per cent Suffolks, 25 per cent Belgians, and 50 per cent Percherons; this gives you a little idea of the present demand. The Percherons, having been longer established in this country, are the best known and lead in numbers. In a new section, use your own judgment in selecting a draft breed that meets your requirements, and for which there is a good demand. If there is a draft breed already established in your section, study carefully the possibilities of further development of this breed by cooperation and community breeding.

"What is the best kind of mares for a farmer to start with?"

Pure-bred draft mares, if possible. By cooperative buying, good, sound registered mares can be selected for $500 each. If a smaller investment is required, buy pure-bred yearling fillies at around $250 each. Next to the pure-bred mare, choose the active grade mare of high quality, weighing 1500 pounds or more, having two or more crosses of the same draft blood as the sire you will cross her with. Such mares should cost about $250 each. Do not delay your breeding operations for ideal conditions; grade up with the best pure-bred draft sire available from any kind of mares you have on your farm.

"What age can a mare be bred?" When a filly is well grown, at two years of age.

"What percentage of mares get in foal?" Probably 60 per cent with about 50 per cent living foals. This low percentage of breeders is due, first, to many old mares on your farms; second, to the purchase of many western mares that have been sold because barren; third, because most farmers fail to return their mares regularly for retrial. On our government horse farms I believe the living foals run as low as 8 to 10 per cent.

"What care should I give my brood mare?" Regular work up to foaling time, bred again the ninth day and regular work again. Most farmers feed too much hay, especially as soon as a mare foals, which allows her to fill up and look as if she were in foal all the time.

"How can I guard against loss at foaling time?" The loss of colts at foaling time is principally from four causes — smothering in the blanket, navel infection, constipation and loose bowels — all avoidable. The safest course is to be with your mare when she foals, quietly assisting her, if necessary, and getting a veterinarian at once if there seems to be serious trouble. Remove blanket from colt's head; tie, cut and use antiseptic on navel cord. Give a tablespoonful of castor oil with first milk, to avoid bowel trouble.

"What is the best feed for mares and colts?" Alfalfa and crushed oats. During thirty-eight years' experience in growing and developing hundreds of pure-bred draft colts, I have found nothing better. Crushed oats are used by most of the draft horse breeders in England, but not largely in this country. It is not advisable to limit a growing colt to one kind of feed, although I have seen colts kept in good, thrifty condition on alfalfa alone. Oats are rather expensive for most of us to use. A cheaper, and also a perfectly safe feed, can often be found in corn — whole, cracked, or ground. Rye meal or middlings may be used; also, molasses, if used with a liberal amount of bran. Sorghum, or early amber cane, makes the best fall feed when pastures are short. Ensilage can be used if fed with judgment, but beware of moldy ensilage or millet for your mares in foal.

"Can I doctor my own horses?" Not by experimenting with untried remedies or the neighbors' advice. There are reliable lines of veterinary remedies which, with a veterinary thermometer, are desirable in locating and treating any sickness of farm animals in the early stages.

DISCUSSION

QUESTION: I should like to ask if a feed of two pounds of oil meal, two of bran, and two of rye meal would do for a colt weighing about 600 or 700 pounds, used with timothy hay?

MR. AKIN: Of course we have all breeds of horses, and all sizes and conditions in this state. There is a very wide variation, and even with colts of the same weight, I have seen two colts of the same breed and same size that should be fed quite differently. It is up to the man who is feeding that colt to watch his colt closely and see that he is kept gaining. No certain rule or line of feeding applies to all colts.

The oil meal, I should think, was a little heavy. The best result I have seen from the use of oil meal is not from large feeding. Still better results can be obtained from the use of ground flaxseed — not as a feed but as a laxative. It is somewhat more expensive, but you can use a little of it with other feed and watch the colt's bowels. A very small amount of flaxseed meal will produce good results. The principal thing with this feeding question is to keep your horse's digestion in good shape. It is not what you feed him, but how much good the horse gets from the food. The question is, how to get the greatest results from the smallest amount of feed, and this applies in the use of flaxseed meal.

Another cheap thing is powdered charcoal, which is one of the best things, if a little is fed three or four times a week, to sweeten the stomach. A horse also needs salt. Those things can be used as required. I am also a great advocate of bran; I like plenty of bran with any kind of feed, especially for colts. Use a little more bran in your feed and a little less oil meal.

If a man is growing very much stock he can afford to get a barrel of the cheap feeding molasses; it costs only a small amount. If you will feed a little of that on the roughage, cornstalks, ensilage or bran, taking half molasses and half water, they will eat it better, and it will do the animals a lot of good. Watch your animal closely. He does not need to be loaded with fat. It is not necessary to go to extremes. However, I have never seen any colts in this state that were overfed. If you are raising a draft colt that should mature at 1600 pounds, and you finish him up at 1200 pounds, you have a misfit; it will cut off $100 in the value of your horse. That is not good business.

We do not have to experiment with this proposition. We have the example of the foreign countries which have originated the draft breeds, and which are producing the highest class of heavy horses in the world. We can watch the results of what they are doing. They are feeding just according to the animal they are producing, which means that a man can judge as to the feed by watching his colt. The hair should be laid down nicely and the skin should be loose. It means the middle course which most economically transforms every pound of feed into horse.

VOICE: My colt is growing well on this feed and feeling well, but he does not seem take on much flesh.

MR. AKIN: It is not necessary for him to take on flesh. He is simply growing.

QUESTION: Isn't oil meal the cheapest?

MR. AKIN: Oil meal is good, but I think a little more bran and a little less oil meal would be an advantage.

CARE OF THE HORSES' FEET AND HORSE DENTISTRY

DR. C. W. BRODHEAD, MONTROSE, PA.

Mr. Chairman, Ladies and Gentlemen: In coming before you this morning to talk along this special line — the care of the horse's feet and teeth — I wish to say that I come before you as an everyday, practical, horse-shoeing man. I am going to try to give you a few points that may be of some interest to you on the care of your horse's feet and teeth. In my many year's experience in taking care of the feet and teeth of the horse, I can say positively that twenty-five per cent of the loss on horses in this country is from carelessness on the part of the owner of the horse — therefore I want the horse to have better care.

CARE OF THE FEET

The horse belongs to the same family as the tapir, rhinoceros, and elephant. In its original condition it was an animal no larger than a fox, with five toes like the other animals mentioned. In the course of evolution, however, its size has changed until in many countries we find it weighing 2500 pounds, while in the long period of changing it has now only one toe, with rudiments of the former five toes showing only in what are called the splint bones. In many cases they are grown to the cannon bone. The horse is now called a soliped, or solid-hoofed animal. In many cases the hoofs are poor and ill-shapen from birth because of the breeder's carelessness in not considering the hoofs of the sire or dam.

Many years ago I made a discovery that about 90 per cent of the colts born were straight-footed and all right, but at three or four years of age 85 per cent were crooked-footed. They rolled over either from the outside or the inside, causing the feet to toe either in or out. I could not then solve the mystery, nor could I get a satisfactory answer from the best authority we had.

I started a series of investigations covering about five years and this is what I found: In the long cold winters of the northern states the colts were put into the box stall or straw shed and kept there four or five months on the straw, or, in many cases, on their own manure and straw and litter; and, as there was nothing to wear against the hoof it grew to a great length, that part next the ground becoming thin and brittle. When turned out to pasture on rough, stony and sidehill pastures, one side or the other broke off. That threw the weight more on one side, and the hoof continued to wear away until the whole anatomy of the foot and leg was changed to conform to the condition of the hoof.

To remedy this, take the colt to the blacksmith in the spring and have the feet pared just as if you were going to have it shod, or, you may be able to do it yourself. Continue this treatment until it goes to the forge to be shod, and you will not be troubled with horses having crooked feet. On the other hand, if the unshod colt goes to the forge with crooked feet, the smith has a constant warfare with the horse, as the lower side of the shoe will always be worn out first.

Now I wish to warn the owner of a colt to look well to its feet during the colthood days. Such troubles as ringbone, sidebone and spavin are, in many cases, brought on by crooked hoofs, thus throwing too much strain on an unequal balance. Never keep a colt standing on a hard board floor which is too drying to the hoofs, nor on a sloping one which puts too much strain on the back cords. This applies to the old horse as well as to the colt. Always keep the feet of the colt or horse in as natural a condition as possible; and, if the feet do become dry and hard, use the veterinary petroleum, which will soften, hasten growth of, and toughen the hoofs. Do not use any animal or vegetable oils on the feet; serious results will ensue, if followed for any length of time, as the minute tubes that go to make up the hoofs thus become closed.

In a description of the foot of the horse, it is customary to include only the hoof and its contents; yet, from a zoological standpoint, the foot includes all the leg from the knee and the hock down. The foot of the horse is undoubtedly the most important part of the animal, in so far as veterinary surgery is concerned, for the reason that this member is subject to so many injuries and diseases which in part or in whole render the animal unfit for the labor demanded of him. The old aphorism, "No foot, no horse," is as true today as when first expressed. In fact, domestication, coupled with multiplied uses to which the animal is put and the constant reproduction of hereditary tendencies, has largely transformed the ancient "companion of the wind" into a very common piece of machinery, which is often out of repair, and at best is but short-lived in its usefulness.

Since the value of the horse depends largely or entirely upon its ability to labor, it is essential that its organs of locomotion should be kept sound; and to accomplish this end it is necessary to know not only how to cure all diseases to which these organs are liable, but, better still, how to prevent them. An important prerequisite to the detection and cure of diseases is a knowledge of the construction and function of the parts which may be involved in the disease processes; hence, first of all, the anatomy must be understood.

The bones of the fetlock and foot constitute the skeleton on which the other structures are built, and comprise the lower end of the cannon bone (the metacarpus in the fore leg and the metatarsus in the hind leg), the two sesamoids, the large pastern or suffraginis, the small pastern or coronet, the coffin bone, or pedis, and the small sesamoid or navicular bone.

MANY HORSESHOERS INEFFICIENT

As the subject is "horseshoing," I want to call your attention briefly to the condition of the horseshoers today. Only about five per cent of them know anything about the anatomy of the foot and leg. That is a sad thing. I was in fifty-four different shops two or three years ago, and what did I find? Just three young men under twenty-one years of age studying this branch of science — horseshoeing. One of them was about eighteen years of age, and all he had ever done was on the floor — driving on shoes, tearing them off and paring the feet to some extent. The other young man had worked at the forge. What was the condition of those two men in regard to doing work for themselves

— to taking care of the feet? They could not do anything at all along that line.

Another man I came across in a country shop was doing a little painting and woodwork, and some horseshoeing. That man was going to qualify himself, to some extent, to do work for the people. A man should study well every branch of business he takes up, and horseshoeing is a science that should be studied.

I had no early education, and what I am going to tell you here is what I have dug out myself. There are only two things a man can do profitably by burning the midnight oil, and those are to study the business he is going to follow and sparking his wife. I want to encourage every man here this morning to study his business well. There is many a young man in this country who is mechanically inclined and who can go into a shop and do a great deal of work very well. I want you to encourage your young men to do this work, and it may be profitable to you. Give them good tools, and say that you want them to work on your farm. Good tools will encourage a young man, if he is inclined to do some of this work himself.

ABUSES OF THE FOOT

I am going to call your attention particularly to a few methods that some of my fellow-craftsmen are practicing at the present time.

In the first place, the sole of the horse's foot is made up of scales or flakes, which, by nature, come off every three or four months. We do not give him Nature's conditions. We drive him on our macadamized roads, and we put iron on his feet, and thus entirely change the conditions. The outer wall of the horse's hoof is made up of miscroscopic tubes, the function of which is to carry moisture. What do we do, many times, to destroy the power of these little tubes? We go into the shop and put our horse in the shoeing smith's hands, and what does he do? On that outer wall he uses the rasp or, often, sandpaper, and removes the varnish which is put on there by Nature to protect those little tubes. In that way we destroy their functions. The life of those tubes is gone and they cannot perform their functions.

Many times I have found, where men have done shoeing themselves, that they drive rusty nails into the foot. I have tried experiments with horses of my own. In my country they will tell you that I have driven more lame horses than anybody else, and in fact I have. I did drive them, because I bought them cheap and made experiments on my own horses; therefore I could not be blamed by my customers. I have put nails into salt water and let them lie there and become very rusty. Then I drove four rusty nails on one side of the shoe and four bright nails on the other, and vice versa, so that it was a fair, honest experiment. When I came to take those shoes off in five or six weeks, what was the result? The rusty nails had disintegrated those little tubes, so that I could almost break the side of the wall off with my finger, whereas the side where I had driven bright nails was not affected at all. Keep your nails in a box where they will not get rusty.

There is another thing — we drive in too many nails, which crush those little tubes and destroy them. Another thing we do is to make a big crease where we file them off. That should not be done under any consideration.

There is one other thing that I will speak about hastily — the burning of the foot. That is a fault of my fellow-craftsmen, and I used to do it myself. I have many times taken a dead specimen off a horse's hoof. I would pare it down, I would put the shoe upon the foot hot, and then I would commence to pare it by burning. I could see that discoloration going down in those tubes even from slight burning. What was the result, when I took that shoe and burnt the foot as you have seen many men do — so that it would almost drive you out of the shop? I would take my knife and commence cutting down, when I could see the effects of those burnings — those little tubes so destroyed from my having burned them. Under no consideration allow the shoeing smith to burn your horse's hoof.

A few years ago, when I was in the southern part of Pennsylvania, meeting with the Horseshoers' Association, to which I belong, I got up and talked about this burning of the feet. They almost mobbed me. Now when I talk to those fellows along these lines they agree with me, because they see that many a valuable horse has been ruined on that account.

RELATION OF THE FEET TO OTHER PARTS OF THE BODY AS SHOWN BY INTERFERING

I want to call your attention particularly to how closely the horse's feet are allied to other parts of the body. We will take the interfering horse and discover the conditions which cause it to interfere.

A man drives up and says, "My horse interferes and I wish you would look him over." He is emaciated and poor. What do I tell that man? I tell him to feed his horse well, give him good sanitary conditions and not drive him so hard, and then bring him back; and if I cannot shoe that horse well then, not to bring him again. My examinations along this line show that one-fourth of the horses interfere today from that cause — being driven hard, underfed, etc.

The next man comes up and says, "My horse interferes; I wish you would shoe him so he will not do that." I look the horse over pretty well — he is a fat, sleek-looking fellow — and I find that the harness is badly adjusted on his body and that the breeching is down too low. The great majority are from four to six inches too low. One-fourth of the horses interfere from the bad adjustment of the breeching; as in going down hill or over uneven ground, the legs are drawn together, causing the ankles to hit. Sometimes there is a good load behind him which pulls his legs, causing him to hit his heels, as a result of which he interferes.

A third man comes up and says, "My horse interferes." This is a well-formed horse; his feet are in good shape, and his legs likewise. But I find that he has an elongated tooth, or other defects of the teeth. I put that horse up into the corner, fix his teeth and send him away in good condition, and that horse stops interfering. Why did that horse with bad teeth interfere? From the very fact that the long tooth cuts the cheek, and when we pull the bit up in his mouth he tosses his head, and his head goes one way and his feet another. So we have one-fourth of the horses interfering because of tooth trouble.

I have one-fourth left to put on the poor blacksmith. Shall I? No; you are guilty — some of you. You have been trying to cross the runner with the pacer; you have been trying various kinds of crosses for something better, and you get crosses which are not right. I have seen a great many of them. So there is some interfering caused by bad breeding.

CARE OF THE TEETH

I am now going to take up the care of the teeth. The teeth change so quickly that you cannot tell very much about the front ones.

The science of horse dentistry has been sadly neglected in the rural districts, and by that lack of knowledge on the part of horse owners much of the usefulness of the horse is lost.

Xenophon said more than 2,000 years ago, " No foot, no horse," and at this time I will add, " No tooth, no horse." After forty years of shoeing horses and thirty-six years of caring for the teeth, having in that time been a close observer and investigator, I can safely say that 25 per cent of the economy of the horse is lost in this country by neglecting these two members of the body; and it is my design to try to give some points that may lead to the better care of the teeth on the part of horse owners.

I often hear this remark: " Why, my father always kept horses and he never gave any thought to the care of their teeth." That may be true, but many a horse's days have been shortened by not having such attention. In fact, until the last few years no one was qualified to do anything to horses' teeth; dentistry was one of the last branches of veterinary science taken up by American colleges.

Originally, the horse's teeth were perfectly fitted for grazing and grinding, but man has changed the food from soft, tender, juicy grasses to hard, dry, woody, fibrous food, which taxes the teeth more than soft food.

There have been many fakes handed down from time to time by " hoss men " which many people think are true and do not stop to consider how inconsistent they may be, such as telling the exact age of a horse by his teeth, wolf teeth causing blindness and many other things I might mention.

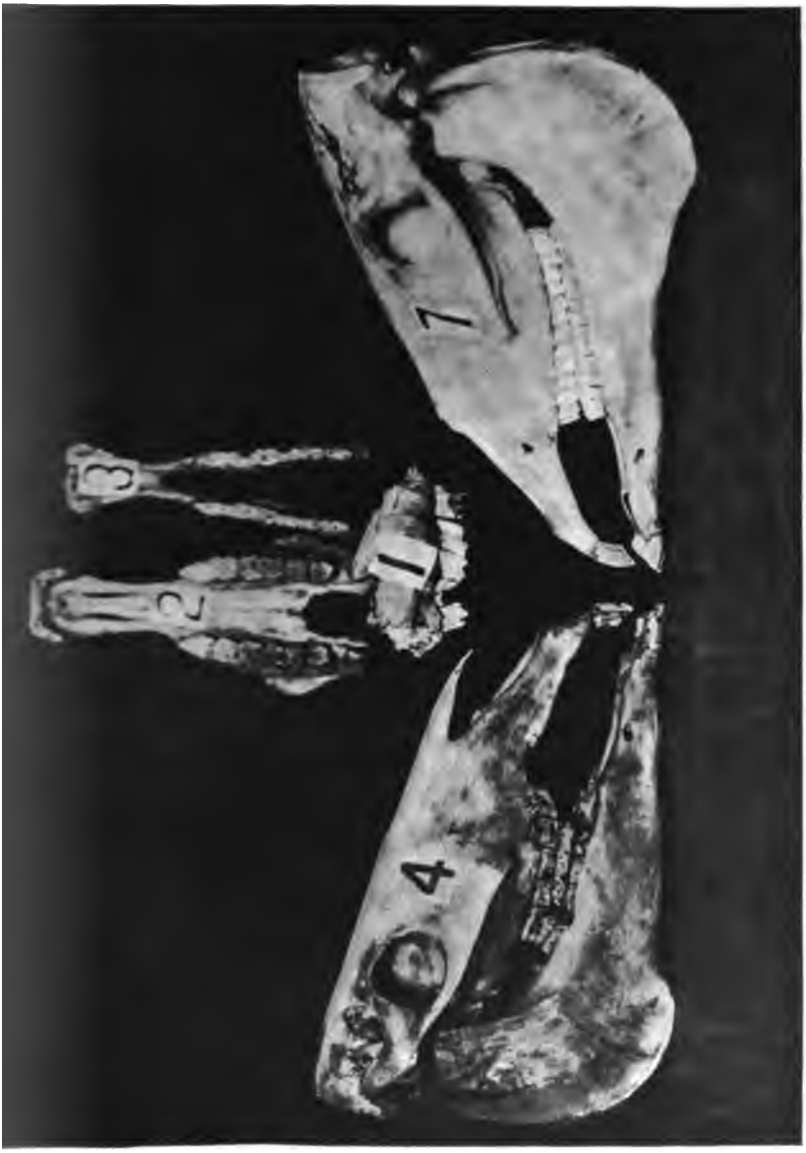

Fig. 534.—(1) Part of Upper Jaw of Horse That Starved to Death by the Under Jaw Wearing into the Decayed Cavity of the Upper Jaw, Wasting Away the Jaw Bone; (2) and (3) Jaw of an Eight-Year-Old Mare; (4) Head of a Mare Thirty-Seven Years Old When Killed. Note Loss of Teeth; (7) Head of a Fourteen-Year-Old Mare. The Most Perfect Mouth Ever Seen by the Writer at This Age.

The mare has only thirty-six teeth, as she is minus the canine tushes or bridle teeth, as they are generally called. The male or stallion has forty teeth. The bridle teeth in most cases show themselves any time from two and one-half to eight years of age — sometimes in early castrations they may not appear in the gelding; I have found such cases.

The colt begins to shed the milk teeth at the age of two and one-half years, and should have a full mouth at five years, but that is not always the case. I have many times taken out both the corner incisors and the molars at six years old, and I have known that the horse had been badly kept, hence both body and limb had not fully developed, and the teeth were retarded likewise.

The jaws of the horse are peculiar in their make-up, the under jaw being from one and one-half to two and one-half inches narrower than the upper jaw and forming what may be called a convex-and-concave surface, as the long points on the upper jaw are outside, pushing against the cheek, and the long points on the lower jaw are inside, pushing against the tongue. Since the sharp points do not break or wear off, they cut the cheeks and tongue and cause sores. Difficulties of this kind can be remedied by properly floating the long points off, thus giving the teeth a chance to get a full grinding surface. Often when the colt begins to shed his teeth, the shells or milk teeth will be crowded out by the permanent teeth. Owing to the convex-and-concave surface they are frequently crowded against the cheek or tongue, causing the same trouble as the sharp points in older horses. They should be taken out to give the new teeth a chance to come in proper line.

From many causes, horses will have split or broken teeth, others becoming decayed and hollow. It is necessary to extract such teeth and then every year or two the tooth opposite will need to be filed or cut off, since, if there is nothing to wear against it, it will grow down or up as the case may be and wear into the cavity and cause trouble. The teeth on the upper jaw are always growing down and out, while the under teeth are always growing up and out; in the case of a six-year-old the teeth may set in the jaws one and one-half inches, when at twenty they may just hang to the jaw, and at twenty-five many of them may be entirely gone.

There are many things to be taken into consideration at this point, as different breeds of horses have better teeth than others; also, horses grazing or being fed on hay that is cut from low, sandy bottoms — especially that land overflowed by rivers or creeks — will show wear on the teeth much faster than those grazing or fed on hay cut from hillsides where there is not much grit or sand in the grass or hay. This holds good as to both the incisors and the molars. A horse that is generally stabled will not show so much wear on the incisors as a horse that is in a pasture a good share of his life, for the reason that in the constant nipping close to the earth he comes in contact with more or less stones and grit that are not carried to the molars. In judging a horse for usefulness I look to the worth of his molars and how badly they are impaired, giving very little attention to the incisors.

The wolf tooth or rudimentary tooth is supposed by many to be the cause of blindness. That is not generally true, as it is very rarely that there is enough inflammation to cause impairment of the eyesight. Many cases that I have examined and treated were caused by the molars crowding the cheek and causing sores and ulcers, which could be gotten rid of by filing the sharp points off, thus removing the cause.

The following are a few of the symptoms of conditions that may be remedied by having the teeth attended to: staring coat, hide-bound, scouring, slobbering when being driven, dropping partially chewed food in the manger, gnawing the manger, running at the eyes, side-lining, tossing the head, periodical balking, spasmodic colic, and many troubles I cannot here mention.

Painful mastication and resultant indigestion (the primary cause of most stomach troubles of the horse) are due to defective teeth. Take care of the old horse's teeth and be sure to look well to those of the colt during the shedding period, as the horse is subject to the same laws as man, and needs the care of the dentist.

DISEASES OF THE HORSE, AND HOG CHOLERA *

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I think, friends, that we shall take up the first part of the time allotted to this particular topic in a brief discussion of hog cholera; reserving what time we have left for any questions that you may desire to ask upon the subject of diseases of horses or diseases of other classes of domestic animals.

There is probably no greater obstacle in the way of successful hog raising than this disease which is known as hog cholera. The losses are enormous every year, aggregating many millions of dollars. Just how great the loss is, it is impossible to estimate accurately; the Department of Agriculture, in some of its publications, has estimated the annual loss at not less than $50,000,000.

INVESTIGATION IN 1877

We did not know much about the hog cholera in this country up to the latter part of the seventies, 1877 or thereabouts, although the disease had been noticed and mentioned in current literature as existing in this country as early as 1833. But in 1877, complaints having reached the department concerning the enormous losses in hogs, particularly in some of the western states, an appropriation of $10,000 was made for purposes of investigation. There were employed at that time nine well-known veterinarians and physicians, each of whom made report, and from the condition reported there can be but little doubt that the disease under investigation at that time was identical with what is known as hog cholera. All problems in connection with that disease were not solved then; in fact, they are not solved at the present time. It was thought by those men that they were dealing with two or three distinct diseases, which they called hog cholera, swine plague and swine fever. They thought the diseases were distinctive because

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* See article on "Hog Cholera" by Dr. Charles Linch in Bulletin No. 64, published by Department of Agriculture, Albany, N. Y.

the lesions and the symptoms seemed to be entirely different. We find now that this disease, hog cholera, has quite a variety of symptoms — that it is all one and the same disease — although there are different manifestations. When they found the disease in the lungs and digestive tract they called it swine plague; when the principal lesions were in the bowels they called it hog cholera. But, as I say, those symptoms are now found in what we know to be hog cholera outbreaks, pure and simple.

To further complicate the situation, they found, somewhat later, that the lesions were the result of garbage poisoning, particularly when kitchen garbage charged with alkaline soap was used.

PRESENT DAY BELIEFS

But out of this maze of evidence we have gradually reached a point where we recognize a disease which is known as hog cholera, and which is due to a small organism, or virus. We believe it is due to an invisible organism. Perhaps that ought to be explained, because the first thought in your mind would probably be that if this little thing is invisible, how do we know it is a microorganism and not something else? We have come to that conclusion because the strongest known virus, as compared with this organism, is in ratio of one to five million; that is, the hog cholera microorganism, or virus, is five million times as strong as the strongest toxic substance known. Further than that, we know that it increases enormously in the tissues of infected animals; hence we believe it to be a living organism. It is invisible, because the strongest microscope that we have at the present time has not been able to detect it. That may be true either because the microscope is not strong enough, or because this organism may be of such character that it cannot be readily strained by any known agent for that purpose. It passes through the finest porcelain filter. You can take blood from a diseased hog and pass it through a porcelain filter, under pressure, and the result will be a material which, if injected into a hog, will produce hog cholera. For that reason we believe the cause to be an invisible, ultramicroscopic organism.

All hogs are susceptible to hog cholera. It was thought some time ago that there was a certain breed of hogs that would not contract the disease, and you may have heard that the Mule-Foot is immune. That is not true. There is no breed, so far as we know, that is absolutely immune.

The period of incubation (that is, the period which elapses between the time that the hog is exposed and when the disease develops) is one to three weeks. In my experience, about seven to ten days is closer. But there have been cases where the disease has developed within three weeks, or thereabouts, after the animals have been exposed to the disease.

SYMPTOMS

The symptoms, as I said before, are varied. Perhaps the first thing that a hog owner would notice in a hog-cholera outbreak on his farm would be two or three dead pigs. Perhaps the following day he would find a couple more; then he would notice that some of the rest, which he had not particularly noticed before, were not coming to the feeding trough as lively as they usually had: that when they came they would eat a little while and then go off somewhere in the corner and lie down.

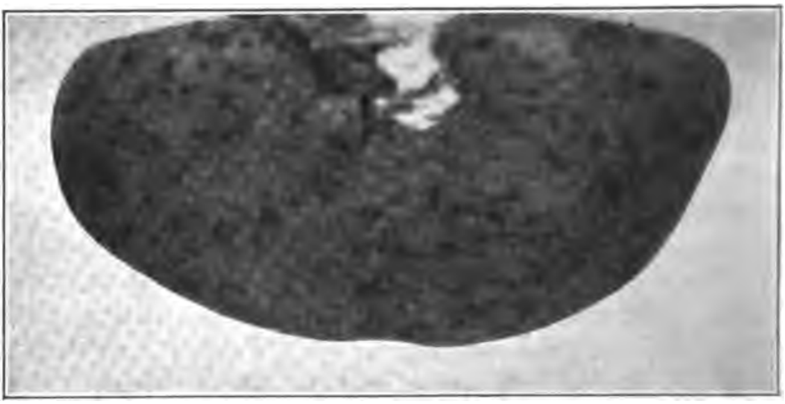

FIG. 535.— KIDNEY FROM HOG AFFECTED WITH CHOLERA, SHOWING SPOTTED CONDITION.

On examining them a little more closely, he would find that there seemed to be a general air of lassitude — that they went around with their heads hanging down. And then he might notice some spots on them — purplish, reddish or blackish spots. One or two of them he might observe were vomiting. Others would stand there with marked symptoms of thumps, breathing very rapidly. He might notice that all the infected animals seemed to have constipation — that their bowels were confined. This is particularly true in the earlier stages. Later on there is apt to be a profuse diarrhea, and this occurs usually before the animals die.

If he were provided with a thermometer, as has been advised, he would find some temperatures as high as 108°. The normal temperature is 102°, but it is not unusual to find a number of them from 104° to 108°. Occasionally a cough is noticed — a rather short, harsh, painful cough. If those animals stir about, an alteration in their voices when they squeal can be observed.

These are the general symptoms of hog cholera — not all present in every outbreak, but all marked symptoms of the disease. If you find such symptoms among your hogs, particularly if the weaker ones are dying, you certainly have every right to believe that hog cholera exists in your herd, and to take prompt measures for suppression.

TWO TYPES OF THE DISEASE

There are two well recognized types of the disease — the one acute and the other chronic. In the early part of an outbreak we are apt to find the acute type. Animals die very quickly — perhaps within two or three days — and that is the reason, frequently, why we find half a dozen dead ones before we realize there is anything the matter with them. The chronic type is the type which is usually seen later, and is characterized by weakness and a marked loss of appetite, with death resulting sometimes in a period of a week, although they occasionally last several months. When an animal has once had cholera and gets in that chronic condition, you might as well knock him in the head, because he will not amount to anything. It takes so long to get them back into condition that it costs more than the hog is worth, and the wisest thing to do is to destroy those animals and get your place cleaned up thoroughly and make a new start.

POST-MORTEM IMPORTANT

By the way, whenever there is a suspicion of hog cholera on the farm several post-mortems should be made as soon as possible; do not get your animal under the ground before the veterinarian comes. Probably the first thing he will say is, "Have you any dead ones?" and if you have he will probably want to open them up. As a rule when those hogs are opened, the first thing that attracts attention is the color of the bowels. They are darker than normal — sometimes red; sometimes a dark, purplish red; in further advanced cases purple; and sometimes quite black. In taking out the intestines, next examine the lymphatic glands. They are usually dark red or black. You will find that the spleen is larger than normal and quite black. After having taken out the intestines, thus enabling one to examine the kidneys, a characteristic lesion will be found in them; they are mottled, due to capillary hemorrhages. Washing will not remove those spots — little red or blackish needle-point spots. If you will cut into the kidneys you will find them a little blacker than normal.

The next thing you would examine would probably be the lungs and heart. You might find a portion of the lungs about the consistency of liver, and the heart having spots similar to those described on the kidneys. If you split such an animal you will find that the bone is usually coal-black; and the skin of the hog, as I have already described, is usually covered with red spots, black spots, blotches — in many cases entirely covered with tiny red spots.

These symptoms are constant. In every cholera outbreak you will find one or more, sometimes all, of these symptoms in different animals. Taking the symptoms presented, together with the post-mortem findings, you can decide whether you have hog cholera on your farm, and take measures for controlling the disease.

HOW IT IS SPREAD

This is sometimes spread by bringing a diseased animal in contact with healthy ones. We find, in a great many cholera outbreaks, however, that no additions have been made to the herd: in other words, the contagion has been carried in some other way. Of course when a hog is brought from some district where cholera is known to be prevalent and placed with the other animals, without taking the precaution of quarantining it, we might suspect that there lay the cause of the contagion; but frequently the disease is carried by the owner himself. He may go to a public stockyard to buy a horse or cattle or sheep, and, on his return, walk into his hog enclosures and carry hog cholera from the public stockyard to his own hogs. When visiting public stockyards, therefore, it is always well to bear that fact in mind and wear rubbers or boots, afterward disinfecting them, or throwing them away if they are of little value, rather than taking the chance of carrying disease to the hogs. The disease can be carried on horses' feet, or on the wheels of vehicles that have been to railroad chutes. It is carried in the litter of railroad cars. It is suspected that the disease is carried by birds, mice, cats, dogs and skunks, or anything that might carry infected material. Thus we can understand how the disease can exist on one farm and escape another farm, and it is well to keep those animals out of the hog enclosures as much as possible. Of course I do not mean that you must stand with a shotgun and keep them away, but you can at least keep dogs and cats and poultry out.

If there is hog cholera on a farm and you hear of it, another good thing is to stay away from that farm; do not go over and investigate for yourself. Let the other fellow have his own trouble, for fear of getting it on your own farm. The same thing results in foot and mouth disease, by the way. I have seen a man have so much curiosity that he had to go and see it himself; and, usually, in a short time he had more foot and mouth disease on his own farm than he knew what to do with. Stay away from infected premises, and keep men away from your place who have the disease on their farms.

VACCINATION AS A PREVENTION

When hog cholera is clearly diagnosed on a farm, what should be the first thing to do? We have an agent now — not a curative agent, it is true — known as hog-cholera serum, which is used for the hogs that have not already contracted this disease. This serum is blood from which the fibrin has been removed, taken from a hog which has been so treated that he has a high degree of immunity — a hyperimmune hog. They make a hog hyperimmune by first injecting serum and virus (to which I will refer later as the "simultaneous method") ten days afterwards injecting a much larger dose of virus, and then later on, after this hog has been made very resistant to the disease, drawing the blood and taking out the fibrin, the resultant product being what is known as anti-hog-cholera serum. This serum does not produce the disease. I would like you to get the distinction between virus and serum. Virus is the blood of a hog which is about to die from hog cholera, and serum is defibrinated blood from an immune hog which has been treated so that it has a high degree of immunity. If you inject the serum into a healthy hog you protect that hog for a period of from one to three months. A much longer immunity can be given those hogs by giving them what is known as the simultaneous treatment, that is, injecting serum on one side and virus on the other.

I do not believe there is a man owning hogs who should be trusted to give a hog simultaneous treatment, because it is so extremely dangerous. If you do not take every possible precaution, you are liable to produce hog cholera where none existed before by giving your own hogs the disease and later carrying it to the herds in the vicinity. So the simultaneous method must be used only under very exceptional circumstances, and then by a man who is familiar with both products. You should be guided absolutely by his advice, not only as to buying the materials, but as to treatment.

But the serum alone — the protective treatment — can be applied by the average farmer if he will follow certain precautions. In the first place, he must use as nearly absolute cleanliness as he can get when working among hogs. He can put down a straw litter; he can take the hog and scrub the site of injection. After he has the rough dirt off he can take a disinfectant solution (any of the common disinfectants) and wash over the site of injection — usually, in small animals, on the inside of the thigh. In pregnant sows it is sometimes wise to inject back of the ears.

After washing, take some tincture of iodine and paint it over the site of injection. The needle and the syringe itself should be sterilized by boiling, and should be dropped into a little pan of antiseptic solution after every hog is injected. Introduce the needle into the tissue and inject the dose of serum that you wish to use to protect the hog. The dose is usually given on the bottle. We usually give from 10 to 15 c. c. For older hogs the dose varies. You may have to give as high as 40 or 60 or 80 c. c.;

the dose should be graded according to the weight of the hogs. After having made the injection, before you let the animal go, paint with iodine over the site of injection. Keep them away from filthy wallows and from weeds full of dust, so that the site of injection does not become infected; that is where the bad results come from. If you use these precautions you can inoculate your own hogs and do it with perfect safety.

In speaking of the methods used to make hogs immune, I mentioned two — the serum alone and the simultaneous method (serum and virus). Then there is a combination of the two, using the serum, for example, on one side, and a small quantity of virus on the other side (practically the simultaneous method), after having protected the hog by a large dose of serum. We believe that if there is such a thing possible as to make a hog immune for life, the combination method (serum and simultaneous) will protect a hog as long as they usually stay on the farm.

Now a word or two as to holding the hogs when you make the injection. The little ones are handled best by taking them between your knees; let some man hold them that way and then you can inject the serum. The larger hogs can be handled by making a slip noose in a rope and passing it up around the upper jaw, and the same way with brood sows. If you will just handle them carefully and get a slip noose around the upper snout, and tie them to a post, you can handle them very nicely.

DISPOSAL OF DEAD ANIMALS; DISINFECTION

After you have protected the healthy ones — the diseased ones will probably all die, whether you give them serum or not — the next thing to do is to dispose of the dead ones. The safest way to do this is either by burying them or burning them. I think burying is perhaps a little easier. They ought to be buried at least six feet underground, in quicklime. Put two or three inches of quicklime in the bottom of the grave to lay the hogs on; throw in more quicklime and cover them up, and you have made the dead ones safe.

Next, the premises should be made clean. Take all the loose litter out to the fields and plow it under immediately. Then take a long-handled broom and sweep down all the cobwebs; sweep down the walls and clean out the feeding troughs — in fact, get rid of all the loose dust or dirt. If there are any loose boards about the place pull them out and burn them. Then get some scalding hot water and scrub the entire interior of your hog enclosure. Crude carbolic acid, which is inexpensive, might be used in the scalding water. Then spray the place with lime-wash to which some disinfectant or chloride of lime has been added. The runways can be probably made safe by covering them with lime and allowing it to become slack on the ground, and then plowing it under.

I believe if you follow that course of procedure carefully you can make your hog enclosure safe, but I would not advise you to stock up immediately after having cleaned up. It is always well to let fresh air and sunlight into a place, as they are two good disinfectants; and as long as we are not familiar with the history of this ultra-microscopic organism, it is well to give natural forces a chance to destroy whatever infection there may be left.

MR. VAN WAGENEN: At this point, doctor, I wish you would say something as to the use of alfalfa.

DR. VOLGENAU: Alfalfa is of great value; it is one of the very best hays that we can feed the horse. I do not know how people became frightened about alfalfa. I know if we have a sick horse that is not eating and we want to bring back his appetite, we usually coax him with a little green-cured alfalfa hay. There is no particular danger in it, although I have heard people tell of kidney derangements and other troubles that were produced by feeding alfalfa in large quantities to horses that were not accustomed to it. We have been feeding horses in the city with alfalfa for years and I have never seen bad results, with this exception: I believe a combination of alfalfa and rolled barley usually results in a funeral. I have seen it fed in one large stable, and the results from it were absolutely resistant to any form of treatment that the veterinarian in the city could devise; consequently they were obliged to omit the rolled barley. That is simply a little leaf out of my own personal experience. I should hesitate to advise anybody to feed that particular combination, but alfalfa is good horse feed; it is very valuable, very rich in nutriment and very palatable, and is relished by the majority of horses.

DISCUSSION

QUESTION: Is there any danger in using ground barley with other feeds?

DR. VOLGENAU: I should say you would have to mix it well with bran, and not use any large quantities of rolled barley. I would advise you, by all means, to put a large percentage of bran in your feed when feeding rolled barley. The same thing applies to rolled oats. I listened with interest to Mr. Akin's remarks about rolled oats, but the more I see of rolled oats the less use I have for them. I have seen quite a bit of trouble arise from them.

QUESTION: Is there a difference between rolled oats and ground oats?

DR. VOLGENAU: Yes; they are smashed up.

QUESTION: You have no objection to feeding oats whole?

DR. VOLGENAU: No, by no means.

QUESTION: Would it be just the same to feed ground oats?

DR. VOLGENAU: I have had no experience with ground oats — that is, oat meal — as in contra-distinction from rolled oats; but I prefer to feed oats whole, with perhaps the proviso that extremely old horses having no grinders left — where the molar teeth are nearly gone — might, with advantage, be fed a mixture of cut hay and either rolled or ground oats, also a percentage of bran and a little oil, if you like. I think it is beneficial, in those cases, to grind the oats. We know that if a man ate nothing but mush and soups his dental apparatus would suffer, and the same thing applies to horses.

QUESTION: Is rye a good feed?

DR. VOLGENAU: I have not had much experience with feeding rye. Rye is all right, with the exception that it is frequently contaminated with a little red poisonous substance that grows on the rye, which is dangerous feed for mares that are heavy with foal. Feed anything to horses, for that matter, if you feed it with judgment. They feed fish in certain localities, and even meat balls with condiments of various kinds — peppers and so on. It is extremely dangerous to experiment with horse feeds. In the city our main reliance is on oats, bran, hay (not too large a quantity of clover hay, but a good quality of timothy hay), some alfalfa, and occasionally corn — corn on the cob, in preference to corn meal. During the winter months, in the extremely cold weather, we like to give the animals two or three or four ears of corn, beginning with one or two and gradually giving them five or six, in conjunction with their other feeds.

QUESTION: Do you consider it of any value to mix finely-cut hay or straw with the oats?

DR. VOLGENAU: Yes, I do. You can not feed corn meal safely in any other way than by mixing it with short hay.

VOICE: I mean cut hay or straw with whole oats.

DR. VOLGENAU: That is all right any time. Corn meal itself becomes like putty; only the outside portion is acted upon, and it causes indigestion.

FIFTH SESSION

TUESDAY, MARCH 16, 2:05 P. M.

ROUND TABLE

MR. VAN WAGENEN: We have a few moments for this Round Table work.

We have just had a topic suggested for discussion. I should like to say, in the beginning, that I make no pretensions to being a veterinarian, so you will understand my position. The subject is in relation to our medicated salts and stock feeds. We know that there are a large number of feeds on the market being sold in wooden pails and paper boxes, and represented as doing wonderful things when fed to an animal. I have seen preparations concerning the nutritive value of which the most incredible statements were made. As I look at it, there is no question whatever but that, on general principles, we are justified in denouncing those things. I believe they are taking a man's dollars and giving him but little in return. They have been analyzed again and again, and very often it seems as though they were made from the same formula. In the first place, most of them have linseed meal, which is one of the very best things that is fed to an animal. They generally contain common salt, and common salt is palatable if they do not get too much of it out of the salt barrel. Then there may be some powdered charcoal. All right; it gives a mysterious appearance and does not hurt anything. There may be also some Epsom salts.

My simple doctrine is that if an animal is really sick we had better call a veterinarian, or give it some approved treatment ourselves. If the animal is all right it does not need any medicine. I speak with some feeling on this matter and become rather indignant upon seeing money being taken away from a man when it is not necessary. As a whole, stock feeds have been made out of materials which are harmless and which have some little medicinal value. They have been made at a low price per ton and sold in small packages at high prices — frequently $200 per ton.

Another preparation is our medicated salts. If anyone has an opinion on that we would be glad to have it. The general composition of these stock feeds has been established again and again, and while there is nothing injurious in them, I cannot believe that, in the amount you buy, they can have any special effect one way or the other.

Regarding sweet clover, if it had any wonderful value, I think someone would have found it out by now. It is a fact that about the biggest nodules you will ever find on any legume are on sweet clover roots; at least the bacteria do work on the roots of sweet clover very freely. On the other hand, I do not think it is a plant you will get a seeding of with as great a degree of certainty as of something else. We see it all over in the various soils, and yet in a cultivated field it does not seem to grow very readily.

The second thing about sweet clover is this: animals are not fond of it. I would rather have a plant that animals were fond of, instinctively, as they are fond of alfalfa. You know there are a few counties in southern Maryland where men do just one thing in the world — they grow tobacco. Joe Wing was down there one time and after he got back he wrote thus about it: "I saw a few lean cows that looked as though they might desire to eat, and I fell to wondering whether it would not be possible to educate these cows, a little at a time, to eat tobacco." We have evidence concerning sweet clover, that it is possible to educate a cow, a little at a time, to eat sweet clover. I am not knocking it for any particular reason, but I am in the position of a doubter: I am doubting whether it will grow readily on a field, and I still more seriously doubt whether it will ever be a great success in feeding material. I see a horse grab the tops of it once in a while, and that is about all.

VOICE: You had better go back to Joe Wing and ask him what he thinks of sweet clover.

MR. VAN WAGENEN: Yes; but it is in the air, this sweet clover. Let us thresh it out; let us get an expression of opinion. One man's opinion is surely as good as another's. How many men here are convinced that animals like to eat sweet clover? [No hands raised.] How many men think they will eat it if they are not fed something else? [A number of hands raised.] That is about the way we all feel. Now, then, we all agree on that. How many see it grow anywhere in a way that will lead you to think you can get a big crop in a cultivated field? [One hand raised.] How many do not feel that way? [More hands raised.] Perhaps, as I say, I know nothing about it, but practically all of you have the same impression I had. I am spending some little time on this because so much has been said about it lately; but I am inclined to feel that we are in danger of repeating the statements of a few enthusiasts.

VOICE: I accidentally got some with some alfalfa. The animals would not eat it unless they had nothing else.

MR. VAN WAGENEN: Professor Agee says he thinks there is something about the sweet clover seed that is not able to make a successful germination except in singularly compact soil, and that may explain why you see it along the roadside.

I have a question here that has been passed in to me, "How much milk per day, and what percentage of butterfat, must a cow produce in order to stay in your herd?"

I cannot attempt to answer that, because very few dairymen set up a specific standard and say that every cow falling below standard has got to go, and because all of us have cows that we like. There are cows that we keep for their mother's sake sometimes, or for their sire's sake. That would be something like this one: "How low would the production in an apple orchard have to be in order to cut it down?" It seems to me that a cow ought to give as much as 300 pounds of butterfat in a year, and yet some have dairies that will not give so much as that. Three hundred pounds of fat is at least a fairly good amount.

Regarding the percentage of butterfat she should give, it is a question of the total amount of fat rather than the total pounds of milk it is distributed through. If a man desires a large flow of only moderately rich milk there is no question whatever but that he would do well to keep a black and white cow. On the other hand, if a man likes rich milk, I think he does well to take one of the Channel Island breeds.

That may not be a very satisfactory answer to the question. However, 300 pounds of butterfat is not a high standard, although it is nearly twice as high as the average. With that standard. there will be a little left over to take care of some of the things on the farm. It does not, for a moment, compare with the profits of apple growing over the country.

QUESTION: How many pounds of butter should one get?

MR. VAN WAGENEN: If a cow gives 300 pounds of butterfat in a year, you must increase that by one-sixth. In other words, that amount of butterfat, if handled by a good dairyman, with a good separator, and the cream well ripened and skillfully churned, and a good job done all through, ought to give you 350 pounds of butter. Of course the results will vary more or less. A man who is not using a separator, and who is churning at too high a temperature and doing other things he ought not to do, will not get it.

QUESTION: What is the proper temperature?

MR. VAN WAGENEN: The proper temperature is the lowest temperature at which you can churn in a reasonable length of time; that is, thirty or forty minutes. However, the temperature will vary. I have known cream that will churn satisfactorily at as low a temperature as 54 degrees. For instance, if your cows are fresh in milk, if they are on grain food, and if the cream is rich — a large percentage of butterfat,— all those things tend toward a low churning temperature. On the other hand, a cow that is not getting much grain and is fed on dry forage in winter, and the cow whose cream is low in fats, and which is unskillfully ripened, is the cow whose milk will have to be churned at a high temperature; you will have to force it up as high as 60 to 64 degrees.

Just a moment, to give you some information on this subject of churning. The old idea, as some of you remember, was that every fat globule in the milk was surrounded by a little membrane or film, and the old explanation was that you dashed it around until those films were broken. How they ever got such an idea into their heads, I do not know. Fat globules are simply round globules of fat floating in the milk. If you liberate a drop of oil below the surface of water, you will see it working up to the surface, and a fat globule is nothing more than this.

The best type of churn is one that has nothing inside of it whatever — that turns the cream over and over. Under practical conditions we use the simple barrel churn. We turn it over and over.

and those fat globules tend to come together and combine, on the same principle as the boy holding several globules of mercury in his hand, and after a little has only one globule. The fat globules come together in that way. If they are too hard, what happens? They strike together and separate again. If they are too soft they come together very rapidly, and all that you get is a mass of oil. So the rule is, adopt the lowest temperature which will cause them to come together in a reasonable length of time; and thirty or forty minutes is the correct time. I think the little, simple barrel churn is the best we have in the market today.

Ordinarily, perhaps an hour is longer than I should recommend churning. I should be willing to churn thirty minutes, and in a factory where it is done by power it may be the best common sense to use the hour. The lower the temperature at which you churn, the less will be the butter left in buttermilk, and that sometimes is a serious loss.

QUESTION: About what ought that temperature to be?

MR. VAN WAGENEN: About the lowest you can ever expect will be 54; and, usually, unless something is radically wrong in the ripening or some other condition, you ought to be able to churn at 58, 60 or 62. But when you have to churn as high as 64 degrees, I should say you had made some mistake somewhere. You see there are more exceptions than rules in this butter business.

QUESTION: What do the whitecaps come from?

MR. VAN WAGENEN: The little so-called whitecaps may come from two or three different causes. One of them is this: the old shallow pan, which was once used very largely, was often placed somewhere where the air blew over it, and sometimes, in dry weather, the cream would not break up. It generally means that a bit of cream has coagulated hard and firm — in other words, a little buttermilk is enclosed in the butter, which everybody dislikes.

We have with us this afternoon Professor Wilkinson, who has been a market gardener of wide experience, and who is today a teacher in Cornell.

* CROPS FOR THE CANNERY

PROFESSOR A. E. WILKINSON

Extension Instructor in Vegetable Gardening, Cornell University Ithaca, N. Y.

I hope that the people have not confused the question of crops with the apple. You know they put the apple and the pear in cans. What I wish to speak about is the placing of vegetables in cans. Most of you know that New York State is one of the largest canning states in the Union. Probably you do not realize that there are six important vegetables to can — tomatoes, sweet corn, peas, beans, spinach, and beets. Of these six the spinach is the new one, and spinach would be of particular interest to men who are growing vegetables on a certain type of soil.

IMPORTANCE OF SEED SELECTION

How many men or women in the room know about, or have practiced, the question of seed selection? How many have selected seed of known parentage? Probably none. How many know whether or not their farms are particularly adapted to growing these crops? How many of us rush in without knowing about what we are doing? Why is it that I find men are growing pears for canning and it is costing $30 per acre to grow them, and they are getting $20 in return? Why is it that I go up towards Oswego and find men growing sweet corn which is not adapted to that locality? Because the canning factories, or the men, have not been on their job; they do not understand the peculiarities of the adaptability of the crop they are growing.

Now, then, there is a wide chance right here for men to study the question of adaptability. It would be far from my wish to advise a man to grow late corn when he should be growing extra early types, or late peas on early sites. I mean by that, light sand. If you plant Duke of Albany or Champion peas, which come late in the season, how can you expect to have such a crop pay you? You cannot do it, because it would not be a good, sound business plan.

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* Send for Bulletin No. 70, entitled, "The Vegetable Industry in New York State," published by the Department of Agriculture, Albany, N. Y.

There are many other things that can be taken up along this same line, about the adaptability and variety of the vegetables to their location. How many men here know anything about the value of their particular product, as far as its parentage is concerned? Probably few. How many men ask their dealer how many tomatoes have been produced from a particular strain of seed? Anybody here present? Wait until I read you a few items. You may be interested in the early tomato. For many years back a college has been carrying on tests with different strains — some from Philadelphia, New York, and so on,— until they have a great many different strains. The average farmer will say that the early tomato is the same everywhere. The name is the same but the product is not; it may vary in color. In this test, running four years, seed obtained from Mitchell, Philadelphia, produced 16 tons per acre. The same seed purchased from Columbus, Ohio, gave 16.8 tons. Philadelphia gave 16.29 tons. The lowest of all was obtained from Canada, which produced less than

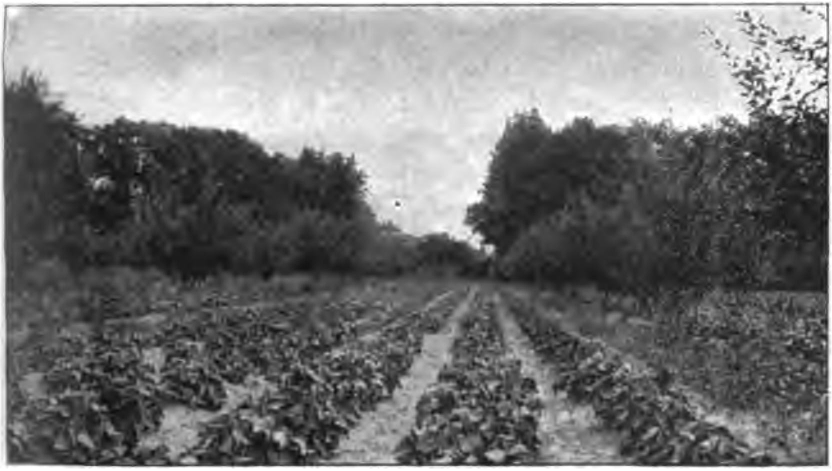

FIG. 536.— GROWING BEANS FOR CANNING.

11½ tons. Is it of any interest to you to know where you can get seed that will produce sixteen tons instead of eleven tons? Is it any difference to you whether you have $90 more in your pocket or not, just on a question of seed? I think if you are growing the Earliana, you have something worth while. Here are the four-year tests for Chalk's Early Jewel: Detroit, 18.2 tons; Mitchell, Philadelphia, 17.8 tons; another firm in Philadelphia, 17.5 tons; the lowest of all, Burpee, Philadelphia, 11.4 tons. Does it make any difference to you whether you have seed that will test out right? There is a difference of seven tons in one particular test.

Then I have Matchless Beauty and Globe here, which probably you are not growing. This test was for two years; that is not so good as one that runs three years. In all tests the first year matters very little; the second year you know a little better; the third, a little more; the fourth, still more; the fifth, positive. On this one Baltimore gave 18 tons to the acre; Burpee, second, 16.4 tons; the third, 16.3 tons. The lowest man is Rockford, Illinois, 10½ tons, or a little difference of over seven tons.

In some of these vegetables which we have before us, especially the spinach, very little work has been done in testing out seed, because spinach is so cheap. However, it should be done. More care should be exercised with the beets, carrots, beans and peas. I shall give you a little example as to peas. Peas that are large size will produce one-third more than peas of a small size (from a test running three years in a neighboring state, Michigan). Where there is a large number of split peas, we find that the yield is one-third less than the small pea. It means you have a crop which does not pay. So it is of importance to see that the peas are free from weevil, and that not many are split. A large pea denotes, generally, not that the particular plant is a plant which produces large peas, but that it had proper conditions for its growth, and was selected, as far as possible, from a parent of the same kind.

This question of seed is very important if we are to progress in the work. We have the market at a stated figure; we have the land. We should adapt the crop to that particular land and get the largest crop possible for the cannery.

SOIL CONDITIONS

There are points of considerable importance concerning the soil. With most of these crops we cultivate for a short time only: with the spinach we hardly cultivate at all; with peas often not at all; with corn and tomatoes and sometimes beans we cultivate longer. No matter how much we cultivate — or how little — the same thing is true. We should prepare our soil differently than we do for some other crops. Take the tomato, for illustration — it is inclined to produce an abundance of roots. The roots are found mostly in the top surface soil, which we turn over; in other words, the furrow slice. We find 75 to 90 per cent of the roots in this top soil. If you plow only four and a half inches deep, what can you expect of the crop? And then if you follow up that plowing by deep cultivation, how can you expect the plant to grow correctly? How can you expect the plant to respond and give you twenty tons of tomatoes to the acre, or twenty tons of anything to the acre? I do not think it is reasonable. We find many men, however, plowing only four and a half or five inches and passing over the land only twice; they call it harrowing, and then they wonder why they are not able to meet expenses. It is more of a question of deep plowing now than ever before. A great many farmers of the state have robbed their soil so much that the top

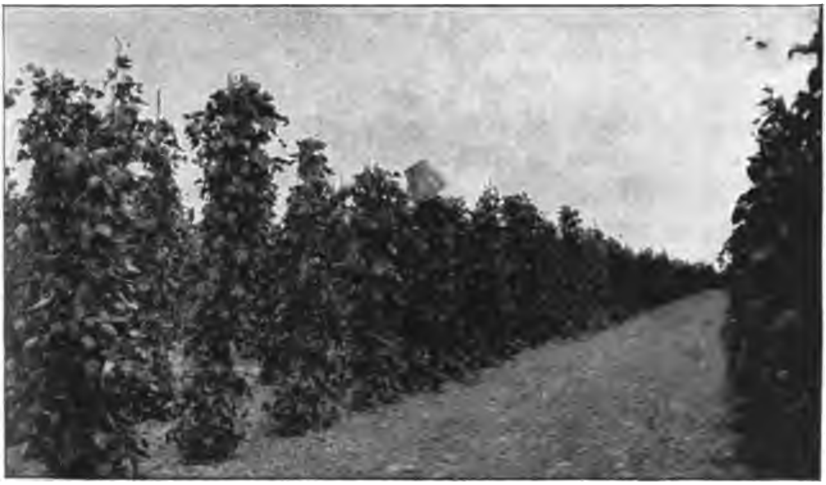

FIG. 537.— POLE LIMA BEANS, GROWING UNDER FAVORABLE CONDITIONS.

soil does not respond even to fertilizer. I can show you places where fertilizer is not strong enough to make the plant grow correctly.

I should say, plow the land seven inches deep and then fit it as it should be fitted. I think the rule should apply that the land should be fitted as well as possible, and then go over the top and fit it again. I think there is a great deal to that particular point.

IMPORTANCE OF HUMUS

There is one particular part of the soil that men are beginning to consider more seriously, and that is the humus. We find that if we plow anything down, we add something to the soil; we know that there seems to be more water and more activity in the soil; that the plants respond better, and in a great many other ways the land produces more and better crops. We can trace it back in every case to humus. There are soils in certain sections of this and other states where the humus has been so depleted that, even with two or three tons of fertilizer to the acre, it is almost impossible to grow a crop. Humus, then, is an important factor in the growing of crops. We find that the fertilizer man speaks correctly when he says that all the food for the plant will not come out of the fertilizer bag.

Take any one of the crops I am speaking of at the present time — there is not one that is benefited more than the other by humus. Take spinach, for example; spinach grows best on muck soil. And what is muck? Forty to seventy per cent humus. When you compare a crop on that kind of soil with a crop on some other soil on a farm, you can see the difference.

Perhaps I have said enough about this soil. I understand from what little I have studied of the general location here, that of these six vegetables I have named, perhaps you would be more interested in growing tomatoes than any of the others. Is that true? Well. perhaps I should dwell on that crop, then, because I have material enough here to last for quite a while if I speak on these six.

TOMATOES

Just lately I have been out in Erie County, where they grow a great many tomatoes for the canning factory, and also ship many of their early ones to market. They have requested to know of some method by which they could decrease the cost and increase the return. I find, though, that when you bring something to these men that may be of great interest to them, they are not willing to try it out until someone in the neighborhood has "shown" them. A year ago I obtained the consent of one man there to follow a scheme of transplanting tomato plants which was opposed to their method. They gave the plants forty-nine square inches of soil, about seven inches deep. The method I proposed was not the solid-bed method, but the paper pots. A great many men have questioned it; they said, "Why not use the clay pot?"

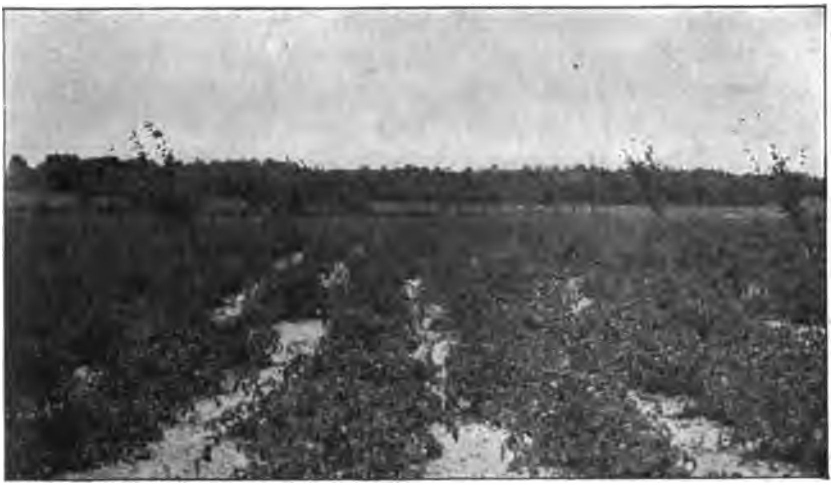

FIG. 538.— TOMATOES GROWING AT WILL, THE GENERAL PRACTICE WHERE GROWN FOR CANNING.

Well, just look at the clay pot. You will find it very narrow at the bottom and wide at the top, and the roots have a tendency to go down. Compare a four-inch clay pot with a four-inch paper pot, and there is more soil in the paper pot than in the clay pot. The clay pot is round; the paper pot is square — just as broad at the bottom as at the top.

This gentleman tried paper pots. Instead of going in light he planted 14,000. He planted them in an exact way, and was the first man in the market with early tomatoes and received more money than ever before, in comparison between the paper pots and the other method.

There is another item. He has greenhouses and glass beds to raise these plants under. Formerly he occupied forty-nine square inches for each plant, and with a paper pot four inches square he only occupies sixteen square inches. In other words he has one inch over and raises three plants where he raised one before. That means a decrease of cost of glass. He can raise three times more plants than before. At the same time it costs no more to look after three times the original number of plants than it did the original.

Then there is another fact which he learned — that he was enabled to save the roots in transplanting. With the old method he had to block out the soil and remove all that soil, and he cut off and wasted a great many valuable roots.

I think the assertion will hold good, that he was the first man in the market and had a larger crop from that portion of land than he did under the old method. This coming year he will grow all his tomatoes in paper pots.

That is just a little suggestion I make. If anyone is interested in growing his own plants, or does not contract elsewhere, I should advise trying them. I know last year you had a very large crop of tomatoes, but the year previous the season was short and you were not able to get a crop that was worth while. If you practice a method where the plants are a little more developed, you would be able to get your crop through the season better than where you have poorer plants. When you consider that it takes some of these plants three months before they will produce a crop worth while, you will understand why it is necessary to have a larger plant when you wish to transplant in the field.

IMPORTANCE OF ROTATION

There is another question of importance, which is so hinged with other questions that probably I can take them up together. They are rotation, fertilization and the like. I have heard men say that in growing tomatoes they would use the same land two, three or four years without bad results. They are very fortunate. It can be done; but is it a safe and satisfactory practice? If you were able to pass around the state as I do and look over the different methods of farming, you would conclude, I believe, that it is not a safe practice to plant the same crop on the same piece of land the following year. It is a much safer practice to plant tomatoes this year and sweet corn or some other crop next year. Remember that humus is something that you need in the soil, and plant a crop that will produce humus. Rotation is so important to some men who are farming successfully, that at the last cultivation of the crop of tomatoes they sow clover seed on their land, in order to get humus. I know of men in Erie County who are growing tomatoes for canning, and who sow clover in this way.

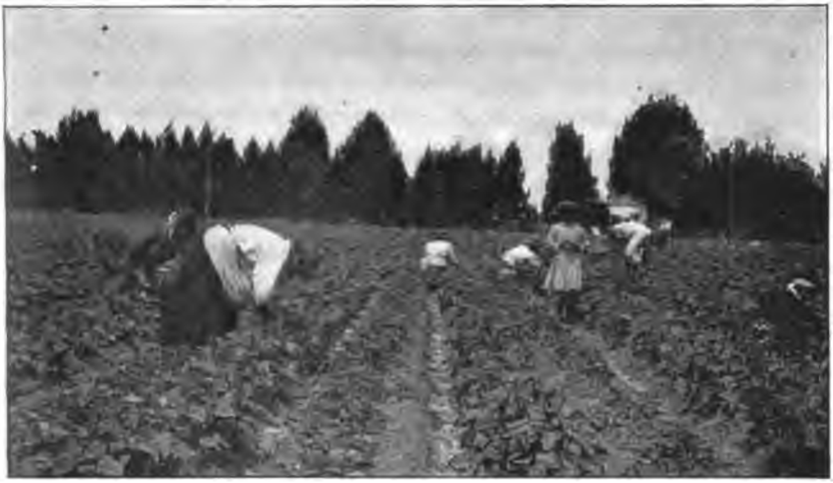

FIG. 539.— HARVESTING SNAP BEANS.

The next year the land is given over to cucumbers or sweet corn. In that way they increase the humus in the soil and bring about a soil which is much better.

DISCUSSION

QUESTION: How much clover seed would you sow?

PROFESSOR WILKINSON: About eight quarts. Some men will get along with less.

QUESTION: What kind?

PROFESSOR WILKINSON: Generally, medium.

QUESTION: Would you plow it under the next year?

PROFESSOR WILKINSON: Plow it under; yes. It is for soil improvement.

QUESTION: Do you get as large an amount if you plow under the first year in time for sweet corn?

PROFESSOR WILKINSON: Not if you are growing Stowell's Evergreen; but if you are growing another type of corn and planting May 25, you will have plenty of time. It depends on your crop.

Now with this rotation there is another item, and that is the fertilizer. Where we find men planting good crops in rotation, producing humus, we find that they need less fertilizer to get the same crop. In other words, if they practice good, sensible farming, they have less need to spend money. That is particularly true in a great many cases. I know of men in the state who have yet to buy their first pound of fertilizer. As I said a few minutes ago, if the fertilizer man tells you correctly, the fertilizer that he sells you will be most valuable in a soil full of humus. That matter would have much to do with the amount of fertilizer to apply. If a man asked me how much fertilizer to put on, I should ask him what he grew on his land and how. Then I could answer his question with more intelligence. The use of fertilizer varies not only with the rotation, but of course with the crop and with the season and with the soil. It is a question, with some soils, whether as much nitrogen as we have been using is important, and whether acid phosphate is not the food that we need more than any other.

Take, for example, the tomato. A great many men have advised the use of nitrogen. We find that tomatoes having an application of nitrogen alone, in the form of nitrate, will produce only about twelve to fourteen tons per acre; and in opposition to this, that nitrogen derived from dried blood will give a difference much greater. In the same year, where these two were tried, the largest yield was from dried blood. So there is something to think about — from what form your nitrogen is derived. Experiments have been tried with different forms of phosphates. In most of the experiments it has been determined that tomatoes need more acid phosphate than has been considered necessary. I know some formulas are 2-6-6, 2-6-8, 2-6-5, 2-6-4, and the recommendations now are coming to 2-8-4; that is, they are increasing the amount of acid phosphate 2 or 3 per cent. That would be in the right proportion. We know, if we study plants, that acid phosphate is necessary to form the seeds and fruit. We must have it, and we must have larger applications on the soil.

You may be interested in a little experiment in cauliflower that was tried out in Erie county, by myself, on one of the farms there, where it was conclusively determined that nitrate of soda and potash were not seemingly necessary for that particular type of soil, because when nitrate or potash was applied they made only a moderate growth. But when acid phosphate was applied the plants grew high and produced the most.

QUESTION: How would you apply it?

PROFESSOR WILKINSON: That depends on how much you use. Five hundred pounds or less would be applied in the row. Some men who are using a large amount of fertilizer on a crop put a certain amount in the row with the plants. I had an argument with a man about growing potatoes, and he said he used only 500 pounds in the hill. That man used manure and cover crops. He was doing the same thing as a great many other men who broadcast their fertilizer. It is necessary to have the food scattered in the soil; therefore put the small amount near the plant and apply the main strength through the soil so it will continue to push them along.

QUESTION: Would you apply it at the time you set out the plants?

PROFESSOR WILKINSON: Yes, I should. That is the best time to apply it — just previous or at the same time.

I was speaking about fertilizer on tomatoes. The question came up as to which form of potash to use — the sulphate form or muriate. It was proved that sulphate was the best. Men tried the experiment for three years with sulphate and muriate, and the result indicated that where sulphate was used the crop was 22 per cent better than where muriate was used. Get your nitrate in two forms — from nitrate of soda and from blood. Get your phosphate from acid rock, and use potash in the form of sulphate.

[At this point Professor Wilkinson made use of the blackboard to illustrate his talk, and showed different items as to transplanting and cultivation of tomato plants.]

I should like to bring up the point here of the price of plants.

The test was carried on for three years, in order to get fairly uniform results. In this case the plants were grown in a seedbed; the plants were not thinned, nor were they transplanted. When I was selling them they were sold at fifty cents a thousand, and that is about all they were worth.

The cost per acre of these plants, $1.30. That means for the labor and seed. Value of crop, per acre, $52.60. The yield per acre, 5¼ tons.

Hotbed plants grown in the same way, but the plants thinned. $4.90 per acre for the cost of labor to produce these plants. Value of yield, per acre, $101.50. Yield per acre, 10.15 tons.

Hotbed plants transplanted once, the cost was $4.95 per acre — five cents more than thinning. The yield was 15/100 of a ton more and the returns of course $1.50 more, per acre; in other words, the question of transplanting was not a very important factor. From these figures of three years, the results seem to indicate that if we give a plant a proper amount of room for root and top development, it is as good a plant, and as valuable, as the plant that is transplanted once.

Hotbed plants transplanted twice cost $6.70 per acre; the yield was half a ton greater and the returns $5 more.

Then we have the last one of all — hotbed plants grown in dirt bands. The cost was $8.80 per acre and the yield 14.92 tons per acre. At $10 a ton, you would have $149.20 as the value of the returns.

Now, then, if you take these figures and study them carefully, you will find out this: Compare the dirt-band plants with the seedbed plants, and you will have a difference of $7.50 in your investment and a money return something like $97. If you can tell me where else I can place $7.50 and get $97, I should like to know about it. If you know of any place where you can invest the difference between the cost of the dirt-band plants and the cost of the hotbed plants transplanted twice, $2.10, and get a return of $41, I should also like to know. You will find your money value depends on how you raise your plants. One of the big items in this dirt-band method is the fact that, when you transplant, the plant does not know that you have changed its location; you have all the roots and all the top and the soil it is grown in. The crop comes on earlier and you get your goods in the market earlier, and you have a longer season of fruiting, which may account for the larger yield.

I was going to put on some figures here about cultivation. Does it pay to give tomatoes more than the average cultivation? Here is the test for three years: In 1910 the number of cultivations was fifteen and of hoeings eight, which is above the average. There was a profit, for the above-average cultivation, of $3.60. In that year the results were not very plain — only $3.60 for fifteen cultivations and eight hoeings. That is not very much, but that is only one year. Farming is not made up of any one year, day or hour; it is a thing that passes through our life into the next generation, and so on. The next year the average was three cultivations and one hoeing, and there was a profit of $13.25. In 1912 there were eight cultivations and one hoeing, against three cultivations only, and the profit was $34.70 for the more intense working of the land. The average for the three years was to the extent of $24.70 profit to the man who would give more attention to his crops after they were planted.

I might say, in closing these remarks, that if you are interested in the canning of these crops I should be very glad to cooperate with you on any problems; and those interested in canning will be interested in knowing that we have a little bulletin coming out, before long, on the question of growing crops for canning. *You might find some suggestions there which will be helpful. If you wish to know about the growing of crops for canning, write to me, and I will be glad to send you details about the work; or if you have problems of any nature, I would be glad to have you send them to me.

QUESTION: Have you done anything in spraying tomatoes?

PROFESSOR WILKINSON: Yes, for many different things; in some sections to escape the little flea beetle, which comes early. I have used the same treatment as for the potato; that is, the bordeaux mixture. Some have said, "What can we do for blossom end rot?" We find that that little trouble on the fruit known as a blossom rot has a close relation with the condition of the soil — the more culture the less rot.

QUESTIONS How about the Earliana?

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* Reading Course for the Farm, Vol. IV, No. 83.

PROFESSOR WILKINSON: From the canner's standpoint, they are far from satisfactory. If you like an acid tomato, they would be all right. The Chalk's Jewel is the one most commonly grown in the state. Last year more money was made with the Bonny Best.

QUESTION: What soil?

PROFESSOR WILKINSON: That was a gravelly loam, south of here. I have found the Bonny Best to be a good yield.

QUESTION: Have you tried the Twentieth Century? It is a good canning tomato.

PROFESSOR WILKINSON: Yes. There are four experiment stations testing out different varieties — Maryland, Illinois, Iowa and Ohio. From two of the stations that carried on tests, the report is that the Greater Baltimore will outyield any other sort. I should be particularly interested to obtain for men here four or five different sorts and have them tested out in their soils. I met a man last week who is going to test out these varieties for canning work. If you are interested I should be glad to take up the matter with you.

LIVE STOCK ON THE FRUIT FARM

JARED VAN WAGENEN, JR., LAWYERSVILLE, N. Y.
Farmers' Institute Lecturer

Friends, I must say something to you this afternoon about that rather peculiar and rather difficult subject — stock on the fruit farm. I ought to establish my own position and say that I have come from the eastern part of the state, from that portion which is more in the Catskill Mountains, where we know about milking cows, and where our fruit interests are entirely subsidiary I am speaking from the standpoint of an animal husbandryman, rather than from a standpoint of a fruit man. Our fruit interests are confined to five or six acres behind the barn, which we use as a runway for swine, and I presume that is not orcharding as measured by Orleans County standards.

THE SCIENCE OF FARM MANAGEMENT

The fundamental position I should like to take on this would be dictated by the principles of farm management. Farm management is not a new science. Our fathers and grandfathers were farm managers, and some of them were better farm managers than

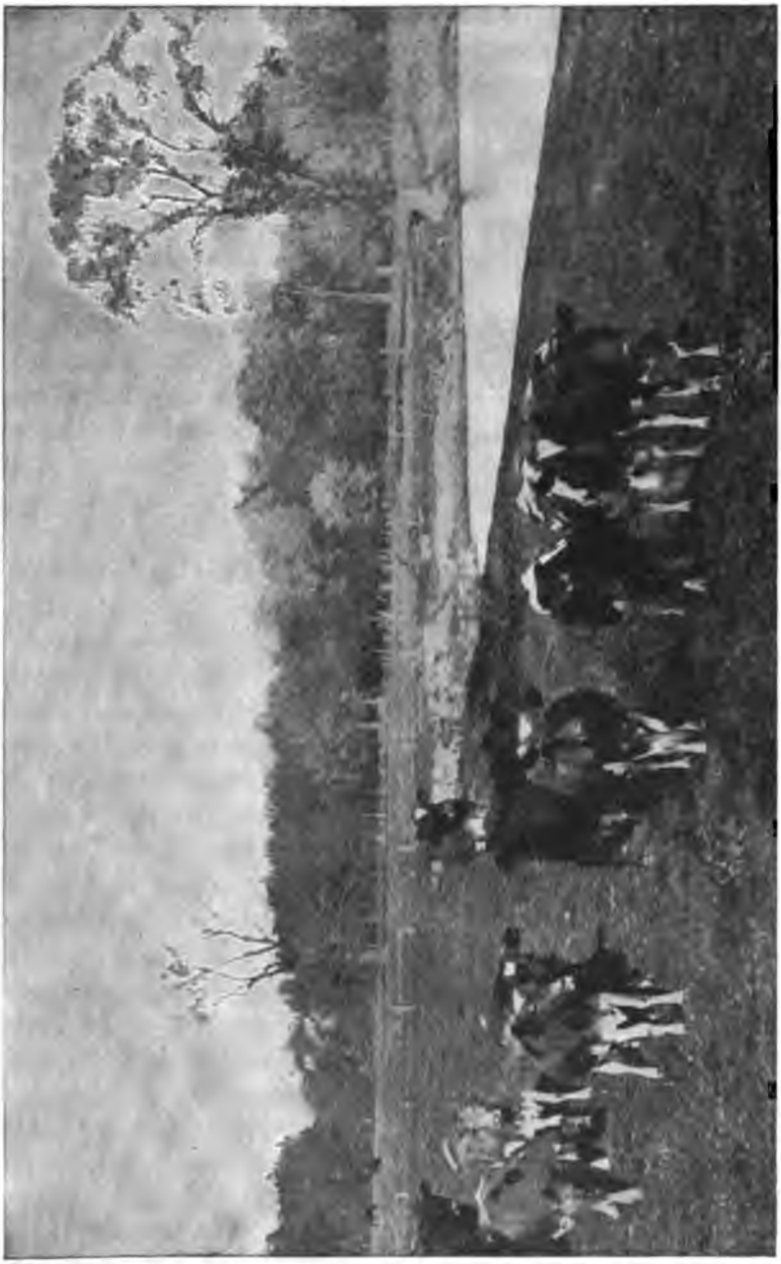

FIG. 540.— DAIRY COWS HELP TO EMPLOY LABOR THROUGHOUT THE YEAR ON THE FRUIT FARM.

others. As recently as twenty to twenty-five years ago, when I was at Ithaca, I think nothing was said there officially about any such subject as farm management, and yet within a few years it has come to be widely talked about and studied, and a new science has been opened up. When they come to investigate the reason of why one man gets along better than another, and why one locality gets along better than another, and why one system of farming seems to pay better than another — when they come to investigate the facts, then we get the science of farm management, and many things are being brought out.

For example, they find that a man who has cut his farm up into many small fields suffers on account of that fact. Farm management says that the man who has two hundred acres of land and locates his buildings in one corner of the farm, so that he has to draw his stuff three-quarters of a mile to get to one corner of that farm, is seriously handicapped in the race as against the man who has his buildings in the center.

Yet, farm management has come to say that the thirty-acre farm is too small, usually. A man can make a fine living and own an automobile, I suppose, on a thirty-acre farm if he does the right type of farming. If it is put in strawberries or celery or tomatoes, it may actually give a man bigger business and more money than two hundred or four hundred acres given over to poor dairying. The real unit of a man's business is the size of his business, rather than the size of his farm.

Yet, on the whole, for general farming — that is, for farming which is made up of cows, apples, and some grains — the kind of farming pursued in most of western New York — the farm-management people have said that, as a rule, a farm should have about two hundred acres, in order that a man may afford to have the labor-saving implements that he needs. Now they go a little further and say that, other things being equal, the best-managed farm and the farm that stands the best chance of success in the long run, is the diversified farm. Some men have said, "Do not put all your eggs in one basket" — this for those interested in diversified farming. Others have said, "Put them all in one basket and take mighty good care not to drop it." And that is the position the dairyman takes. Paul said, "This one thing I do."

I am ready to stand here this afternoon and say that if you could go around our state and pick out the men here and there that have made the most conspicuous success in life, I think perhaps they might be men who have been specialists, within the narrow meaning of the word — men who were dairymen or who were orchardists. And yet I question, in the long run, with the majority of men, whether that is the wisest type of agriculture.

I believe the most conspicuous apostle in this country of this new science of farm management is Professor Warren, of Cornell. He says that a man may be keeping just about all the cows he can keep on his farm, he may have about all the cows that he has room for in his barn, and about all the cows that his force of labor can milk; but he may, in addition to that, raise five or ten acres of potatoes between the times he is doing the chores, and if he does that he has the five or ten acres as "velvet."

THE SPECIALIST

Within the past few weeks, I have visited Long Island. That's a singularly interesting country. There are some very fine men on eastern Long Island; their ancestors settled Long Island and their descendants are there yet. At home or abroad, there is no finer type of citizenship anywhere than the Connecticut Yankee, such as settled this section. At Bridgehampton I met this condition this year: Men came into the meeting there who were prosperous; there were men who owned land that was worth $200 or $250 an acre, and yet they were men who were so absolutely specialists that they did not have a cow on the farm, and they provided themselves condensed milk for dinner.

I am here this afternoon to ask the question, and try to talk about whether or not the fruit specialist has any business to have anything else on the farm; whether or not there is any place for the animal on the fruit farm. I think I know, in a general way, something of the splendid prosperity of this Ontario shore. Men who know the state are pointing up here and saying, "There is God's country." Being a dairyman, myself, and not a fruit-grower, I can gracefully make the admission that there are tales coming out of this country which show the finest results, even on a specialized fruit farm. But there may be a place for the hog and for the dairy cow, and possibly some other type of farm animals. One reason for that is this: We have the farm labor question, and men are always agreed that it is one of the hardest questions we have to settle. While today there are thousands of men in the cities who cannot secure employment, at the same time there will be thousands of farms this summer where labor will be available, and where there will be no men ready to accept. That may be the fault of the farmers. There are many farms where there are too many seasonal occupations; it means that at certain times of the year there is a rush and sweat, and then again there is a long winter season when the help are not employed. We ought not to expect the farmhand to make a living for himself and family during eight months of the year. There is nothing better to solve that question than the ability to give a man the opportunity to labor throughout the year, and there is nothing that will help in the solution so much as will the dairy. There is hardly a county in New York State which, unless it has within its borders one large or growing city, or more, is not declining in population. There are at least twenty-eight counties in this state that have less population today than in 1860. Really, men, nearly all of our strictly agricultural country is declining in population. I have in mind the county of Delaware; that county is, I think, without doubt,

FIG. 541.— SHEEP ARE A VALUABLE SOURCE OF INCOME AND MANY TIMES CAN PASTURE IN OLD ORCHARDS.

the most highly specialized dairy county in the state of New York. Those of you who remember it will know it is a county of rugged hills and valleys; it is a county which has not for a moment any such splendid possibilities of life as you have here. But because the men who came into Delaware County one hundred or more years ago saw they could not do more than one thing in the world — and that was to milk the cow — there has been built up in that county a tremendous dairy interest. All over Delaware County, men are keeping big dairies of twenty, thirty, forty or sixty cows.

Now, what does all this amount to Simply, that Delaware County is one of the counties of the state which is conspicuous in that, notwithstanding it has no large cities or villages in its borders, it has about as much population as at any time in its history. In other words, it has taken so many men to milk those cows that the farm men have stayed by them.

THE DAIRY COW AND THE SWINE HAVE A PLACE ON THE FRUIT FARM

Now, then, to the more practical aspects of this case. As a dairyman, I have no business to try to tell you how your orchards ought to be carried out. I should be making a mistake if I advised you to have hogs run through your orchard. I do say this: there is a quantity of refuse fruit rotting on the ground and possibly being injurious to the ground. I do feel that if, on very many of these orchards, the refuse fruit had been taken care of every day as it fell during the summer and fed to hogs, there would have been good money in those hogs when fall came. I think I am familiar enough with some of your fruit pests to know this. Take, for instance, the codling moth and the railroad worm — if the falling apples can be promptly eaten by hogs those pests will tell no tales. It seems to me that sounds like common sense.

I am largely making suggestions here today of what, it seems to me, might be done, rather than to tell you exactly what you ought to do. I certainly think it is true that the dairy cow has a place on a great many farms. Isn't it true that there come the lean years, so that we cannot put all our land in fruit? In this country the natural thing to grow with fruit is some wheat. There should also be clover, and the man who has the clover has the best of beginnings possible for the roughage for a dairy cow. After the clover, corn is naturally coming into rotation again, and along with that, of course, would come the silo. My idea is not that you ought to grow less fruit. People who grow fruit as successfully as you do here ought to keep it up; but sometimes I think a man can get so intent on one particular phase of the business that he forgets the side lines which might profitably go with it.

As to the by-product of the dairy proposition, I should try to work to the ideal of not selling the milk. There is something demoralizing about a 40-quart milk can. When you get the skim milk you have a very good feed for your hog, and with the apple you have the carbonaceous side. I am not much of a bookkeeper, but would like to tell you of one season's results with a forty-year-old orchard, which, judged by the standards of you men, would not be considered very well kept. Yet one year a bunch of pigs ran there, taking what skim milk we had during the summer, and they gathered up every windfall apple before it was three minutes old. We gave them a little grain in addition, and when fall came and we killed that bunch of young pigs, a nice little check came to us, and I thought that there was a nice little by-product. I cannot conceive but that the hog will always be in play wherever fruit is grown.

FIG. 542.— HOGS ARE UTILIZERS OF BY-PRODUCTS, AND MAINTAINERS OF FERTILITY.

Last year you complained that there were too many apples, and I am going to say this: Here I am in the village of Albion, in the greatest apple country of the state of New York; and as I passed through your city today I looked in your windows and saw apples for sale — the most measly, dried-up apples imaginable. It seems ridiculous, men. I come from a county that does not grow apples, but I was not very desirous to go in and buy two or three of those apples. I am sure there are lots of apples that go into barrels which would bring more money if they could go into a hog. I am sure, men, there is a place for the hog on the fruit farm.

BY-PRODUCTS AND THEIR UTILIZATION

In regard to intercropping the young orchards, Mr. Burritt is coming here tomorrow afternoon and he will talk on that very subject. Of the crops adaptable for a young orchard, there is nothing superior to beans; and the man who has his cull beans, and his bean straw, has a good start toward the maintaining of live stock. In the winter, when you cannot attend to apple trees, the beans can be cared for, and they will drop into your lap as a sort of by-product.

I have not tried to lay down very specific factors, because when it comes to orcharding I am willing to leave men of Orleans County to their own orchards. But I want to draw your attention to the fact that the man who diversifies his farming and receives a considerable number of by-products from it, is the man who is most apt to succeed. Let me sound a personal note, if you will. I happen to be on a farm at home — a rather rough farm — where orcharding is only a little side show; the most we have sold is 476 barrels in a year. Our main interest is dairying. We usually sell some timothy hay, some buckwheat, rye straw, and rye grain, and I have been thoroughly satisfied that we have been doing better than if we gave our attention only to dairying.

We have just ten minutes, and I should be glad to have a little discussion on this subject.

DISCUSSION

VOICE: There seems to be a difference of opinion in regard to feeding apples to the cows.

MR. VAN WAGENEN: I should say that there is practically no question or doubt that apples fed to cows in moderate quantities are absolutely beneficial and right in every way. I should say a cow could eat half a bushel of apples a day with only good results to herself. I have really fed a great many apples to cows. Once in a while a cow chokes on an apple, but if fed them in a manger there will be no trouble.

VOICE: Half a bushel is perhaps too much.

MR. VAN WAGENEN: Well, I should say that a peck is as high as you want to go. Of course a cow is so wonderfully fond of apples and will eat so many of them, that she will seriously injure herself if you give her the opportunity.

There is no type of farming where the machinery varies so widely as in the cow. In a general way, running over the state of New York, we figure something like this: About one-third of the cows of the state lose money for their owners; another one-third just balances; and, in round numbers, there is about another one-third that makes money. Dairying is not a get-rich-quick proposition, but it has one advantage over all other types of business, you can calculate with a great deal of exactness on your crop for the year to come. You cannot do that with apples. There is no man here who will venture to say whether the apple crop next year will be good or poor. If you have been successful this year in making 30,000 pounds of milk, or 100,000 pounds of milk, and plan about the same amount of business for next year, the probabilities are that you will have just about the same amount of profit.

Another thing is that you know almost exactly what it is going to bring you. On the twentieth day of this month — probably the twentieth day all over the state of New York, wherever the Borden people have their milk stations, their notices will go out saying that the price of milk for the next six months will be so much. In other words, you may look six months ahead and be sure what your milk will bring you. And another thing, we expect that milk next year will be about the same as now.

It has not the possibilities of money that fruit has. It is a business which requires work 365 days in the year; it is work which has to go on absolutely through sorrow and through sickness, through death and through marriage, and everything else. The work on the dairy farm must be done even though the heavens fall. On the other hand, you know how big your crop will be and almost exactly what your business will bring you. I am inclined to agree with Governor Hoard, of "Hoard's Dairyman," and say that the dairy farmers are the most successful people in the world; although I do recognize that successful fruit growing has far greater possibilities.

The best general utility cow, to my mind, is certainly one of four recognized dairy breeds. I do not believe we have any place today for the beef cow or the so-called "general purpose" cow, as they have in the West, where grain is more abundant, and where men are a little lazier and a little less intelligent than they are in the state of New York. I do not believe we want the beef cow, but we do want one of the four recognized dairy breeds. We have four breeds of cattle which, for long periods, have been bred for just one purpose, and that is the production of milk and butterfat. Those breeds are the Jersey, Guernsey, Ayrshire and Holstein.*

I wonder if you are making milk for the market to sell by the pound where everybody brings their milk and gets the same price for it, which is now $1.40. This is a commercial system so ridiculous that I wonder how it has lasted so long. I would just as soon expect a man to stand in the door of a freight car and receive potatoes — one man drives up with a double wagon-box load, and the next man with a load half as big gets the same price. We do stand for a system of selling milk where every man receives the same price for his product. Of course the more intelligent producers of milk are getting away from that thing.

Perhaps you would be interested now to know just what they are paying for milk in Cobleskill. There is a basis for all milk containing 4.2 per cent butterfat; for each one-tenth below that they will deduct 4 cents a hundred pounds, and for each one-tenth above that they will add 4 cents a hundred pounds. If that milk is delivered from a barn which scores 68 or above, they will add 10 cents per hundred weight to this price. This is putting a premium on good dairying, and it is what we want. Now, then, if you are going to sell milk to one of those benighted places that takes every man's milk at the same price, regardless of quality, you are in wrong. If you make milk containing

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* Send for Bulletin No. 50, Department of Agriculture, containing descriptions of four dairy breeds.

3.4 per cent butterfat, the Holstein cow literally has no competitor; she is in a class by herself. On the other hand, if you are making cream for market, or if you are catering to a high-grade market which demands rich milk and is willing to pay a substantial premium for milk of that character; or, if you are making butter and selling butterfat generally, the smaller cow of the Channel Island type — the Jersey or the Guernsey or the Ayrshire — will be found to be the most economical for that sort of thing. You must keep the kind of cow that is adapted to the farm on which you live. You men here have naturally a Holstein country, because you have a level land, where cows get their feed easily.

I think at this time Professor Wilkinson will take up the concluding work of the afternoon, which will be in the form of questions relating to farm gardens.

*QUESTIONS PERTAINING TO THE FARM GARDEN ANSWERED

PROF. A. E. WILKINSON

Extension Instructor in Vegetable Gardening, Cornell University, Ithaca, N. Y.

The following is a copy of the printed question slips furnished:

Preparation:

1. Does it pay to buy seeds from a mail order house?
2. What is a good method of testing seeds?
3. About what size plot would be suitable for a farmer's garden?
4. What shape is the most desirable?
5. What is the most desirable soil?
6. When should the ground be plowed, and how deep?
7. Would there be any objection to increasing the depth four or five inches at one plowing?
8. What is the advantage, if any, of deep plowing?
9. Is there danger of getting the ground too rich?
10. Should the plant food be supplied by farm manures, or commercial fertilizers?
11. If farm manures are used, should we use fresh, coarse manure, or well-rotted manure?
12. When should it be applied, and how thick?
13. Would commercial fertilizer be more beneficial to early sown vegetables than those sown later in the season? Give reason.
14. Would a top dressing of nitrate of soda be beneficial? If so, how often should it be applied and how much per acre?
15. Is sod ground desirable for a garden?
16. Does it pay to own a hand cultivator and seeder?
17. Why does a garden plot require more thorough preparation than a cornfield?

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* Bulletin No. 70, "The Vegetable Industry in New York State," may be obtained from the Department of Agriculture, Albany, N. Y.

Varieties:

18. What are the best varieties of (a) beans, (b) beets, (c) cabbage, (d) carrots, (e) corn, (f) cucumbers, (g) lettuce, (h) muskmelons, (i) onions, (j) parsnips. (k) peas, (l) potatoes, (m) pumpkins, (n) squash, (o) turnips, (p) tomatoes?

Planting:

19. What vegetables should be planted in the hotbed?
20. When should they be planted?
21. What vegetables should be planted as soon as ground can be worked in spring?
22. Should seeds be covered as deeply early in season, when ground is cold, as later when the ground is drier and warmer?
23. If potatoes and peas were planted very early, how deep should they be covered at time of planting?
24. Should more dirt be added as sprouts appear?
25. Is there any time gained by planting potatoes with sprouts on?
26. How may the short-stubbed sprouts be encouraged?
27. How early can peas be planted?
28. Is it best to plant small vegetables, such as onions, beets, radishes, etc., in beds, or in long rows — same as corn and potatoes?
29. What is the best distance between rows?
30. In what direction should the rows run?
31. What makes the earliest greens?
32. What vegetables require quick growth by extra heavy fertilization?
33. What is the best distance to plant (a) corn, (b) potatoes, (c) squashes, (d) cucumbers, (e) pumpkins?
34. Is it important to press dirt around seeds?
35. How deep should the following be planted: (a) beans, (b) peas, (c) corn, (d) beets, (e) squash?
36. What vegetables could be advantageously planted at different periods during spring and summer?
37. Is it possible to plant too many varieties?

Hotbed:

38. How large a hotbed is necessary for the farm garden?
39. How deep should the pit be dug?
40. Is it necessary to have horse manure fresh?
41. How much manure is required?
42. How much soil is necessary?
43. What is the best method of distributing the heat through the soil?
44. In what direction should the glass slope?
45. Is it advisable to ventilate?
46. At what temperature of soil should seeds be sown?
47. At what time should hotbed be started?

Transplanting:

48. At what time should cabbage be transplanted?
49. Is it absolutely necessary for ground to be moist?
50. Explain the process of "wetting in."
51. Is it possible to transplant beets with success?
52. When should tomatoes be transplanted?
53. At what distance should tomatoes be set?
54. Should soil be pressed down hard around plants?

Thinning:

55. Should plan of planting garden be so arranged that plants and vines requiring lots of room late in the season can occupy the space left vacant by the early maturing vegetables?
56. At what distance apart should the following be left for best growth: (a) beets, (b) carrots, (c) onions, (d) parsnips, (e) lettuce?
57. How many stalks of sweet corn should be in one hill?
58. What is the best method of thinning corn?
59. What plants make good greens when thinned?

Cultivation:

60. Does the garden require all hand work?
61. Under what conditions should a horse cultivator be used?
62. Should the cultivator run as deep later in the season when plants are nicely started as it is run early in the spring? Why?
63. How often should the garden be cultivated?
64. Is it necessary to use the hoe for all plants?
65. Is it necessary to hoe when there are no weeds?
66. What garden plants require hilling?
67. Is there any danger of injuring plants if hoed when wet?

Injurious Insects:

68. What will destroy the tomato flea-beetle?
69. Can potato scab be prevented?
70. How are tomato worms controlled?
71. Is it safe to use paris green in the garden?
72. What will save the peas from plant lice?
73. How can plants be protected from cutworms?
74. Can the spinach flea-beetle be destroyed?
75. What causes blotches on beets and spinach?
76. What causes early cabbage and radishes to wilt and die?
77. How can cabbage worms be destroyed?
78. What will kill the cabbage lice?
79. How can cucumbers be protected from the striped beetle?
80. Give the best method of controlling the melon lice.
81. What will destroy squash-bugs?
82. What is the name of the beetle which is reddish-brown with black spots that feeds on squash leaves?
83. What causes squash and pumpkin leaves to rot and fall off?
84. How can the garden flea-beetle be destroyed?
85. What will kill the caterpillar that injures celery plants?
86. What is the insect with the peculiar odor that feeds on carrots and parsley?
87. What causes leaves of young carrots to turn red?
88. What will control the onion maggot?
89. How can asparagus be protected from beetles?
90. How does fall plowing help to control insect pests?
91. Will a frequent change of the garden plot affect the insects?
92. Do weeds act as breeding places for injurious insects after the crop is harvested?
93. How does heavy fertilization help to fight the insects?
94. Does it pay to destroy vines and stalks left after the harvest?
95. How is kerosene emulsion made?
96. What is the best method of spraying the under side of squash leaves?

Harvesting:

97. How long does it take early peas to mature?
98. How quickly do radishes grow?
99. What vegetables must be harvested before the frost?
100. How late can turnips and beets stay in the ground?
101. How soon are string beans ready for use?

Storage:

102. What vegetables keep best in the ground all winter?
103. What are the disadvantages of storing in the house cellar?
104. Is it possible to store vegetables out of doors all winter?
105. What is the best method of building a root cellar?
106. What is the best method of storing cabbage?

Miscellaneous:

107. Does it pay the farmer to grow his own garden seeds?
108. Is it profitable to raise more vegetables than are required for the family?
109. What is the best way to dispose of extra vegetables?
110. How often should radishes be planted?
111. What is the best situation for a permanent asparagus bed?
112. What is the proper method of handling endive?
113. When is kale in the best condition for use?
114. What part of Kohl-rabi is used for food?
115. What advantage has Swiss chard over other vegetables for greens?
116. In dry weather should the garden be watered? If so, how often and in what quantities?

After these slips are given out, if you will just call the number of the question in which you are particularly interested, we will take it up.

A great many people do not recognize the importance of the home garden. Many think it does not amount to anything, but there is no one thing on the farm which will stop more outgoing money than the farm garden. The first thing a man does on a farm is to eat three times a day — and on some farms five times — and if he is going to eat, the cheapest thing to feed him is vegetables. If you take all of your cash to the store and exchange it for food, I cannot see how you are very well off. On the other hand, if you get a few seeds and plant them carefully, there is no reason why you cannot save a large proportion of your living. Ask some of the farmers in the state how much their gardens represent; in some cases they will say seventy-five dollars, in other cases they will say one hundred dollars, and others do not know.

Question No. 1. Does it pay to buy seeds from a mail order house?

PROFESSOR WILKINSON: Mail order houses staying in business for a considerable number of years are classed as reliable; however, their business is not seed business, but to sell various classes of goods to a great many types of people. I should say, No; I should not advise buying them from a mail house, but from a man who made a specialty of selling such things, and who made a specialty of growing seeds as well as selling them. Mail order houses do have good seeds, of some sorts; they have, however, more chances of having poor seeds.

No. 25. Is there any time gained by planting potatoes with sprouts on?

PROFESSOR WILKINSON: With the early potatoes there is some time gained. If a man will place potatoes out in the sun where they will grow very short sprouts which are broad, thick and heavy, there is a gain sometimes of a week or ten days, and in some cases two weeks. I would say, though, that if the sprouts were very long there is a loss. The sprouts should be short and broad and firmly placed on the body close to the skin, in order to be of value.

No. 2. What is a good method of testing seeds?

PROFESSOR WILKINSON: The best method I know is to take a little box 2½ inches deep and a foot wide and plant a hundred seeds in a row; then, as the sprouts come up in the soil, count them. The best test of all is to plant the seeds and grow the crop and see what they bring forth. The next best is to place them in the soil and grow them in the house. The germination test is valuable, but it will not tell you anything about whether the sprout will come above the ground. You will find that 98 to 99 per cent of ehe seed that comes above the ground will produce a crop in some shape.

No. 111. What is the best situation for a permanent asparagus bed?

PROFESSOR WILKINSON: Sandy loam is the best location, and one that has been worked previously and thoroughly covered and incorporated with manure. I should prefer to put on as much manure as I could spare, and then go and get more somewhere, and work it in as deep as I could. Then I should lay out trenches twelve inches deep, put in well-rotten manure and throw in some soil; after placing the plants in the trenches, I should cover with three inches of dirt, and then put manure on again.

No. 7. Would there be any objection to increasing the depth four or five inches at one plowing?

PROFESSOR WILKINSON: Yes, sir; there would be great objection. If you have tried to grow anything in subsoil, you know what the objection is. In Ithaca, where I am obliged to live, the ground is nothing but subsoil. In my little garden last year I used three two-horse loads of manure, and we were able to get half a crop. This year there will be more manure. You can grow things if you put on enough manure. Farming is a slow process; therefore if you are plowing only 4½ inches deep, plow 5 inches next year and probably 5½ inches next, and then 6 and gradually up to 7 or 8 inches.

No. 11. If farm manures are used, should we use fresh, coarse manure, or well-rotted manure?

PROFESSOR WILKINSON: If you apply the manure to the soil in the spring of the year, use well-rotted, because manure is not available until it is decayed. Also, manure will hold more water when it is decayed than when it is fresh.

No. 107. Does it pay the farmer to grow his own garden seeds?

PROFESSOR WILKINSON: I was wondering if I could think of anything that would pay.

MR. VAN WAGENEN: On our own place we are growing for our farm garden a row of perhaps fifty plants of tomatoes. Those are being grown from the seeds of the earliest well-ripened tomato which we found in the garden last year, the Earliana. It seems to me that those seeds, saved as my mother saves them,— on a piece of writing paper — started with remarkable strength and vigor, more so than commercial seeds.

PROFESSOR WILKINSON: Peas, beans, cucumbers, melons, asparagus — I should say yes. Cabbage, cauliflower, lettuce and celery — I should say no. As a rule, I should say no. I doubt very much if you can buy as good cucumber seed or beans as you can raise. If large peas are the thing to grow, grow them; yes.

No. 104. Is it possible to store vegetables out of doors all winter?

PROFESSOR WILKINSON: It is possible. Parsnips, of course, can remain in the ground without injury; but you refer, probably, to potatoes, carrots and beets. I know of no storehouse built that is better than Dame Nature, providing you put these crops deep enough in the ground and cover them with soil so as to protect them from injury and frost; but if you want to get them there is some trouble, especially when the ground is hard from freezing. The usual practice is to put them deep in the ground.

No. 105. What is the best method of building a root cellar?

PROFESSOR WILKINSON: For the home garden, probably a space in the ground, four, five or six feet deep, of brick or concrete, with a roof over that and some arrangement for ventilation, and with double doors, so that you can step through one door and have a little vestibule before you step through the other. That is a cheap house. It can be entirely built of hollow tile if you wish.

No. 106. What is the best method of storing cabbage?

PROFESSOR WILKINSON: Dame Nature's — selecting the north side of the fence and excavating and putting the plants in there. Some men place a layer of straw first and lay the cabbage on that, then place soil over the cabbage, and manure over the outside. That is a very good method, and one that could be practiced on the home lot as well. The cabbages can be stored in the cellar. I have made a partition in one corner of the cellar and I have a window that I can regulate; I leave the window open slightly and keep the place a little cool. I place the cabbage in the cellar. The outside leaves will become a little dry, but when you remove these the inside is in good condition. If you leave the roots on, the best way is to place them in a room outside of the house, and keep them cool and a trifle moist. I should not place them any more than three tiers high.

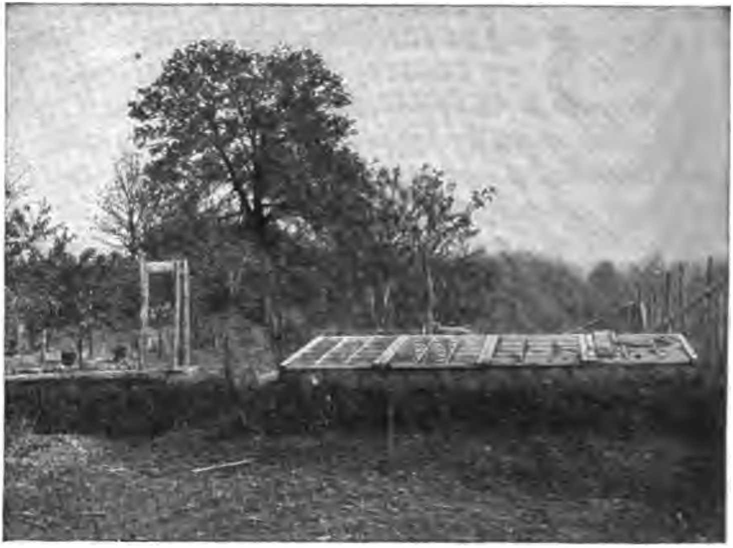


FIG. 543.— SIMPLEST FORM OF MANURE HOTBED. THE FRAME IS PLACED ON A PILE OF FERMENTING MANURE

No. 38. How large a hotbed is necessary for the farm garden?

PROFESSOR WILKINSON: Six by six will be large enough.

No. 39. How deep should the pit be dug?

PROFESSOR WILKINSON: If it is dug now, in the middle of March, a pit of this kind should be two feet deep. You need about eighteen inches of manure until the warm weather comes, so you will have to dig the pit to accommodate the manure.

No. 40. Is it necessary to have horse manure fresh?

PROFESSOR WILKINSON: It is necessary to have horse manure fresh or take old manure and load it with straw and refuse, in order to get the heat.

No. 52. When should tomatoes be transplanted?

PROFESSOR WILKINSON: When they have the first two leaves that come out, and the beginning of the third. They could then be transplanted when they are about that size, the second time (indicating), and the third time about two weeks later.

No. 53. At what distance should tomatoes be set?

PROFESSOR WILKINSON: The first time you place them three inches between rows; the next time you will have to give them more space — at least four by four inches. If I were using the paper pot I would transplant them only once.

No. 54. Should soil be pressed down hard around plants?

PROFESSOR WILKINSON: It is necessary to press the soil about the roots, but not hard. If the soil is pressed too hard the air will be driven out, and you will have trouble if you do that.

In the home garden, if you grow tomatoes on stakes, I should place them about eighteen inches or two feet apart in a row.

QUESTION: Will you describe again the making of those paper pots?

PROFESSOR WILKINSON: I will send you a bulletin which illustrates them.

No. 71. Is it safe to use paris green in the garden?

PROFESSOR WILKINSON: If you keep the chickens and children out of the garden it is safe, but if you allow them to roam in the garden somebody might get hurt.

MR. VAN WAGENEN: How early would you advise the hotbed to be started in this locality?

PROFESSOR WILKINSON: Right here I would advise that it be started in February; there is no reason why it cannot. I have not started mine yet, but that is because I am away. At the College they were started the last week in February, and we have radishes and lettuce at this time.

No. 81. What will destroy squash bugs?

PROFESSOR WILKINSON: A pretty hard thing to say. They are plant-suckers. If you lay shingles on the ground they will crawl under them and they may be captured and killed early in the morning.

No. 79. How can cucumbers be protected from the striped beetle?

PROFESSOR WILKINSON: In a home garden, making a little box without bottom or top, and covering with mosquito-netting, will keep the beetle away until the plant is large enough to take care of itself; then sprinkle with lime. You must keep him out until your plant gets large enough.

No. 84. How can the garden flea-beetle be destroyed?

PROFESSOR WILKINSON: If you hit him with a nicotine solution or kerosene oil it will kill him. The best way is to keep the plant covered with bordeaux mixture or lime.

No. 28. Is it best to plant small vegetables, such as onions, beets. radishes, etc., in beds, or in long rows — same as corn and potatoes?

PROFESSOR WILKINSON: With our modern machinery today, all the work can be done in long rows. Any man-power tool will answer.

No. 72. What will save the peas from plant lice?

PROFESSOR WILKINSON: In the case of garden peas, spray with nicotine solution when they are young. When they are on so thick that you can see nothing but lice, I know of nothing that will save them.

No. 89. How can asparagus be protected from beetles?

PROFESSOR WILKINSON: I wish I could solve this problem so that I could go back to Massachusetts and tell some of my neighbors there what to do. The best remedy is arsenate of lead; spray as often as you can — 3 pounds of arsenate of lead and 50 gallons of water, or as high as 8 pounds of arsenate of lead and 50 gallons of water. Spraying asparagus is very difficult, because the leaves are nothing but slender threads.

No. 116. In dry weather, should the garden be watered? If so, how often and in what quantities?

PROFESSOR WILKINSON: If the garden is 50 x 60, and you spend half an hour with a hose, no; if you go out and do a thorough job, yes. If there is moisture above, and dry just below, and more moisture below the dry layer, it will do no good. If you are going to have a good garden and you want to be sure of getting certain vegetables from it, you should probably have some method of irrigation. If you have a garden 50 x 50, you can buy a line of pipe fitted with nozzles, etc., and be able to irrigate your garden whenever it is needed; if you have a garden 200 feet long and 100 feet wide, you will need two lines of pipe. I should do the irrigating from four in the morning until up to nine, or from three or three-thirty in the afternoon up to nine. The cost of installing the system is the principal thing. There are people who could invest ten dollars in the home garden and get good results. At the same time, even if you irrigate, do not forget that cultivation is necessary. A man who has a good garden, where the soil is full of humus, and who will keep the cultivator going, has many chances of escaping any need of irrigation.

No. 21. What vegetables should be planted as soon as the ground can be worked in spring?

PROFESSOR WILKINSON: Cabbage, beets, peas. Any plant that is hardy can be put out at that time. Last year I knew of a home garden where the man planted radishes when there was ice in his soil. Parsnips and carrots do best when you wait until the weather is warmer.

No. 18. What are the best varieties of potatoes?

PROFESSOR WILKINSON: I do not know that I want to answer that question, because it varies with the locality. The Irish Cobbler is all right, or the Early Rose — a potato that has quality and mealiness instead of size.

No. 3. About what size plot would be suitable for a farmer's garden?

PROFESSOR WILKINSON: That depends on whether the farmer is of the old type or whether he is of the newer type, who thinks the horse has no place in the garden. We have a great many farmers in the state who are doing away with working the horse in the garden; they can do more work in fifteen minutes with modern man-power tools than they can with a horse in three-quarters of an hour. I should advise raising about two or three times what you need. One-quarter of an acre is a good size.

No. 22. Should seeds be covered as deeply early in season when ground is cold, as later when the ground is drier and warmer

PROFESSOR WILKINSON: The new rule is this: The more moisture in the soil and the earlier the season, the shallower the seeds; the drier the soil, the deeper the seeds. If you have a dry, warm soil they should be deeper, to get the coolness and moisture.

No. 27. How early can peas be planted?

PROFESSOR WILKINSON: That depends on the amount of humus in the soil. I doubt very much if many men are present here who will plant seed by the middle of next month. I have a friend at home, in Massachusetts, who has peas in the ground every year before the fifth of April, that he may have the first peas in the market. In a home garden I put in the smooth peas — not high quality — early in April; a little later I put in something that is worth eating, and a little later something better than that. I plant the Early Surprise; then Duke of Albany, then the Dwarf Champion. That will give you a succession and give you quality.

No. 93. How does heavy fertilization help to fight the insects?

PROFESSOR WILKINSON: It helps only in part. The general recommendations are as follows: keep a plant in the best growing condition. When the plant is sickly every trouble comes — insects and diseases and everything else. I cannot see how fertilization would help greatly, except that it makes the plant grow rapidly.

No. 57. How many stalks of sweet corn should be in one hill?

PROFESSOR WILKINSON: Not more than four; Crosby about three, and Stowell's Evergreen only two. Give the plant ample room to grow. If you like the yellow corn, three are enough.

QUESTION: What should be the distance apart?

PROFESSOR WILKINSON: That would vary with the size of corn. Generally speaking, you need three feet. The smaller type you can grow as close as two feet.

No. 75. What causes blotches on beets and spinach?

PROFESSOR WILKINSON: This refers to blotches on the leaves. There are two things which cause them. If you hold the leaf up to the light and see something wiggle inside, you will know that an insect is there; if not, it probably means a disease. I doubt if there is any practical remedy for the disease.

No. 67. Is there any danger of injuring plants if hoed when wet?

PROFESSOR WILKINSON: I would never hoe beans when wet.

How many other forms of disease are helped in the same way, I cannot say offhand. It seems to me I should work in some other direction in preference to working in the garden when the plants are wet. I know the temptation to go in the garden in the early morning and again at night. You can do as much injury to cabbage early in the morning as at any other time.

I might say, before I forget it, on this garden question, that we have quite a number of bulletins which are for free distribution as long as they last.

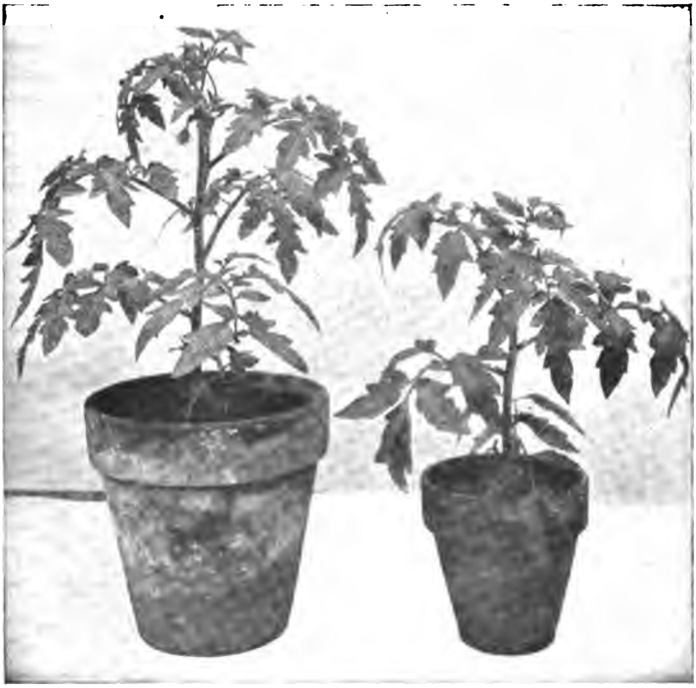


FIG. 544.—WELL-GROWN TOMATO PLANTS READY FOR TRANSPLANTING

QUESTION: What kind of a tomato plant do you set out in early March?

PROFESSOR WILKINSON: The Earliana.

QUESTION: Are the yellow ones better for table use?

PROFESSOR WILKINSON: No, I cannot say that they are. They have their uses.

No. 112. What is the proper method of handling endive?

PROFESSOR WILKINSON: I put the rows 14 inches apart, and then I thin the plants to 14 inches in the row. From two to three weeks before I desire to use them, I tie a string around the collected leaves. They will then blanch inside.

No. 78. What will kill cabbage lice?

PROFESSOR WILKINSON: They can be killed with nicotine solution if you hit them. A man who is growing a crop never thinks about lice until he sees them there by the million. If you start early when the plants are small and keep spraying with this material, the chances will be that you would have but very few. You can kill the eggs by plowing early and burying the eggs. If there is a low temperature — zero or ten above — live lice will be killed.

QUESTION: Is there any way of keeping maggots out of a cabbage bed?

PROFESSOR WILKINSON: The best way is to cover your bed with cheesecloth.

No. 92. Do weeds act as breeding places for injurious insects after the crop is harvested?

PROFESSOR WILKINSON: They do. There are certain insects that crawl under these weeds and live there all the winter and half the spring. Disease also thrives. For instance, if there is disease in your cabbage and cauliflower, and if there are certain weeds in your garden, you will continue to have that same disease in your soil for years.

QUESTION: What radish is best to grow for early market?

PROFESSOR WILKINSON: The Rapid Red or Globe. The small radish will grow very rapidly. Rapid Red in greenhouse and hothouse is good.

QUESTION: Do you think beans are a benefit to a garden?

PROFESSOR WILKINSON: Yes.

QUESTION: Does it pay to keep bees in your garden?

PROFESSOR WILKINSON: Yes, for carrying the pollen.

No. 86. What is the insect with the peculiar odor that feeds on carrots and parsley?

PROFESSOR WILKINSON: The zebra celery caterpillar. You will find him on celery as well.

SIXTH SESSION

Tuesday, March 16, 7:40 p. m.

Mr. Van Wagenen: One thought that has been in the public mind for the last year or two has been the idea of cooperative work, both in the buying and, more important, in the selling of the farmer's products. We have, as you know, a Department of Foods and Markets in the state today. We are fortunate in having with us tonight a man who has had a large practice in that work from the beginning, a man who has done pioneer work in the blazing of the trail along that line. Mr. Tuttle, of Long Island, Deputy Commissioner of Foods and Markets of the state of New York, will speak to us.

THE PROPOSED WORK OF THE DEPARTMENT OF FOODS AND MARKETS

Ezra A. Tuttle

Deputy Commissioner of Foods and Markets, New York City

Ladies and Gentlemen: If I did not know that the farmers of this state and this country were getting too little for their efforts and their investment in the business of production, and if I did not also know that consumers (especially in the cities, and in New York particularly) were paying too much for food, I do not think I should be here tonight, and I do not think I should be engaged in this work at all. But for years I have been studying this subject of the high cost of living, and particularly the low price that the farmer receives for his products.

I am on both ends of the problem. I am a farmer and have a farm of 200 acres on Long Island, and have been producing more or less for the past twenty-five years, and I have been getting poorer and poorer all the time. I have a home in the city and am on the consuming end of it, and there I am getting poorer and poorer all the time, because it costs so much to live in town. On the farm we do not get what we should.

I have studied this problem a great deal for the last twenty years — particularly the last five years. Five years ago this May I retired from my practice in New York, and since that time I have lived on my farm and have studied the question of marketing foodstuffs. Three years ago I was a member of the commission that investigated the subject. We undertook to trace food from the time it left the farm until it was on the table of the consumer. The conclusion of that commission as embodied in its report (which was made about two years ago) was that in New York City alone, under a proper system of food distribution, from $60,000,000 to $100,000,000 could be saved every year. Those are big figures, my friends, and it is easy enough to say them. But from $60,000,000 to $100,000,000 are wasted every year in New York City because there is no system of food distribution. The whole business is as crude and chaotic as it could well be conceived.

There are about 30,000 retail food dealers in New York City. That again is a large number. I have said, and say without any fear of successful contradiction, that 200 properly-located, highly-organized department food-stores in New York City would serve the people better, with better food, than the whole 30,000. Think of that vast army engaged in unprofitable work, unprofitable labor! And still they are not getting rich. I have great sympathy for those retail dealers in New York City — including, of course, the five boroughs of Greater New York. Most of that work is in the hands of Germans and other foreigners, and they work hard, from early to late. Their wives and children help them, and still they are not getting rich; they are not getting more than a fair living, and many of them not that.

BUSINESS IS NOT ORGANIZED

The trouble is, the business is not organized. The multiplicity of delivery is one of the great problems in the matter of food distribution. The block in which my home is situated in Brooklyn is no exception to other blocks, and I think I am perfectly safe in saying that there are thirty to forty different delivery wagons of foodstuffs on that block every day — eight or ten or twelve milkmen in the morning, and then the butchers and bakers and grocerymen and fish-men, and all kinds of foodstuffs. And there they come and go all day long, delivering foodstuffs to the people on a single block in New York City, and that is true of every block in New York City.

I wish you would consider, for a minute, what an economic waste of food distribution there is in that city. There are altogether too many of those retail dealers. Competition is sharp among them. The cost of delivery is enormous. The Food Investigating Commission, two years ago, found that the retail dealers in New York City advanced the price on foodstuffs between 30 and 35 per cent over what they paid. They also found that one-half of that amount, or from 15 to 18 per cent of the whole of the business done by those retailers, was absorbed in the cost of delivering foodstuffs from the retail store to the consumer. They deliver over a large area, and the cost of that delivery is one-half of all the advance that they put upon the price that they pay for the foodstuff when they buy it.

FIG. 545.— RETAILERS' PUSH CARTS ON THE STREETS OF NEW YORK — A MEANS OF BETTER DISTRIBUTION.

Some years ago I had occasion to investigate the milk business in New York City, and I found that some of the Borden wagons traveled as far as twenty-five to thirty miles in a day to deliver 250 quarts of milk. Now those 250 quarts of milk should be delivered on the block in which I live every day; instead of driving twenty-five or thirty miles to deliver that milk, it should be delivered from house to house right along that whole block.

There is no system — there is no regulation at all about the matter of food distribution; hence the high cost of living, and hence the low return to the farmer. My sympathies on this question are largely with the farmer, because I am a farmer and because I always was a farmer. I know that very many dairy cows are being cut off year by year in this state, because the business of producing whole milk for the New York market and other city markets is a business that does not pay. That is true of other products of the farm as well.

I suspect there are men in this audience who could stand up here and tell of instances of the sale of fruit in this section that would be parallel to the sale of other products. I produce a great many lima beans; I send them to New York to the commission houses to sell, and oftentimes — nearly every year — they sell down as low as 35, 30 or 25 cents a bushel. Two years ago, when lima beans were being sold at 40 cents a bushel in New York City by the commission men (that is just about half what it costs me to pick them, furnish the bag, and pay the commission of ten per cent), those same beans were being sold in New York and Brooklyn at retail at 15 cents a quart, or $4.80 a bushel. In Washington Market I went into every stall that handled green groceries, and in every stall they were being sold at 15 cents a quart. Those men could have gone two blocks away and bought the beans from the commission man at 40 cents a bushel. I know other things are in proportion at other times. Of course I do not always produce them at this price; at other times I get better prices.

Last December I asked one of the producers of cauliflower how cauliflower was doing. He said, " The crop has not been good and the prices have not been good at all." He said, " I sent sixty barrels to the New York market and received, as a net return for the sixty barrels, three dollars." That was just one-third of what the old barrels cost him empty. He said it was pretty good 'flower, too.

Another neighbor near me, two years ago, sent in one hundred barrels of cauliflower and seven bushels of lima beans, and he had a return of $15 — just the cost of the hundred barrels.

Another of my friends, who was a grange member, told me of sending twenty-seven barrels of cauliflower, and said that he received a letter from the commission house saying that the cauliflowers had not sold for enough to pay the express charges, and they wanted him to send a check for the difference. As he was a good Christian, he did. I must say that I am afraid my Christianity does not rise to the height of sending a check for that deficiency — the whole expense of packing and shipping, etc., all for nothing, and $1.67 out of pocket.

Those are exceptional cases, but they run all through this whole system. I suspect there are men here who can tell the same kind of a story with regard to the shipment of apples, pears and other things from this section. What is the trouble, my friends? Do you know? You know something is wrong, don't you? You know there is something wrong with the apple business, don't you? You wish it was different, don't you? You do not know, quite, what is the matter, and you do not know quite how to remedy conditions, do you?

PURPOSE OF THE DEPARTMENT

That is why this Department of Foods and Markets was created — to accomplish a reform in this business of food distribution. This department, my friends, was no accident; it was no political trick; it is not playing politics. The Commissioner of Foods and Markets — the publisher of "The Rural New-Yorker," Mr. Dillon — is a man who does not care a snap of his finger for the job, and I did not want it. But at the same time, I have been working on this question for years, and I know that here is an opportunity, and I feel it is my duty to do work on this subject, and I propose to do it as long as I live and am able to.

The trouble is, there is too much handling of foodstuffs in New York City; there are too many commission men, too many wholesalers, too many jobbers, and too many speculators, who handle and sell and re-sell farm produce of all kinds over and over again, and every one, of course, for a profit. Every time it is handled there is a charge; every time it is trucked there is a charge. The figures show (and they have been carefully compiled) that the farmer, the producer, gets only thirty-five cents out of the consumer's dollar; the other sixty-five cents out of every dollar goes in the handling of foodstuffs in New York City. Now that does not hold true, perhaps, exactly in that ratio all over the state, but it holds true in a large degree. You know that the conditions in nearly every city in the state are about as I have described them in New York City. Not very long ago there was a lot of writing and talking about the milk distribution here in Rochester, your neighboring city. You know it as well as I do. You know the conditions there. I do not know but what it is better there now; I hope it is. .

This department was created to serve two classes of people. We propose, if possible — and we know it is possible if we can accomplish our purposes — to give to the producer an adequate price for the foodstuffs that he produces and sends to the market. On the other hand, we know that the consumer is paying too much; we know that he should get the same food, and a better quality — a fresher food — for less money than he is paying today. We know, my friends, that there is twenty per cent additional for the producers of this state and this country in the foodstuffs that come to New York, and at the same time a saving of twenty per cent to the consumers in New York City. That saving, as I have already stated, in New York City alone, would be $60,000,000 to $100,000,000 a year under a proper and economic system of food distribution. This department intends to try to establish that scientific and economic system of food distribution, and I am going to tell you about its plans. It is only fair to you and to the department that the people of this state should know what plans this department has. It was not brought into existence until it had plans — until it had digested this subject fully and carefully and had made its plans.

I shall now outline the plans of this department. First I shall tell you of one condition I have not mentioned. Ninety per cent of the food that daily comes to Greater New York — the whole metropolitan district — is landed on the west side of Manhattan Island; that is, old New York proper, over on the Hudson River side below Fourteenth street. Five hundred to upwards of a thousand carloads of that stuff are dumped on those piers, and on the docks, and piled up mountains high every day of the year, without any provision for properly storing it or sorting it, or for delivery to the people who come there to get it in wholesale lots. The wholesale buyers get there evenings anywhere from sunset to eight or nine o'clock, and wait there sometimes until eight or nine o'clock next morning before they can get their loads, because of the congestion. Does that cost money? I leave that to you. Time is money, and surely so in New York City where one has to hire everything done. Trucking is high, and they have to stand there all night to get their loads. And where is it trucked? All over New York and up to a distance of twenty miles from that place.

I have told you about the congestion. The first thing we want to do is to break it up. That business is established down in that section. The wholesalers are there, and the jobbers, commission men and speculators are there. They do not want it changed at all. That may seem odd, but it is so, and they are going to fight. They will do their best to prevent the introduction of a different system of food distribution in New York City. We have already investigated the market situation in Buffalo and Syracuse and in Albany, but New York City, as you will conceive, is the place where the great problem lies; it is the place where the work has got to be done, and the hardest work — it is the place where you will look ultimately for your market. Of course we know that the local towns and cities ought to be taken care of. Take care of your local market first. But at the same time you have to dispose of your surplus, and it generally has to go to New York or to some other large city.

TERMINAL WAREHOUSES

The first thing this department is going to undertake to do is to establish what we call a receiving terminal and storage warehouse. These terminals and warehouses will be of large dimensions — perhaps one hundred or more feet in width by four or five hundred feet in length, located on the lines of the railroads or adjacent to the docks where cars are brought on floats. There is a bridge that permits of a car being run off the float into this terminal. We want twelve or fifteen terminals in New York — three or four along the North River, three or four along the East River, one in the Bronx, one in Queens Borough, and one in Richmond. Probably more than one in the Bronx. If we can have these terminals where something like eighty or a hundred cars can be run into them and discharged, we will have the cars loaded with foodstuffs and practically landed in the vicinity where the food is consumed. Instead of going down to the west side of Manhattan Island and being dumped there, it will be landed at various points in every borough in the city of New York, and substantially in the general district where the people live, and where the food will be consumed. This is one saving. It will eliminate those long hauls and delay and congestion, and also a lot of middlemen and handlers of foodstuffs. From the warehouses, of course, a large percentage of the food will go immediately to the retail stores. Any surplus, or any stuff that ought not to go into retail distribution, will be put into cold storage or will be manufactured in the warehouse. On the top floor of the warehouse we are planning to have a manufacturing plant, so that berries and fruits that are too ripe and too tender to be offered at retail, can be properly manufactured — good, wholesome food, but too tender to be offered at retail. I have seen hundreds and thousands of tons of such foods, in New York City, taken away to be dumped on the Jersey Meadows, or put on scows and taken away to be converted into fertilizer. The waste in New York City is a crime. There is enough stuff wasted there every year to feed half of the people in that city.

That waste is not confined to New York City. You can go to your own local orchards and find waste. I know there are hundreds of barrels of apples that lie on the ground and rot — good, wholesome food, but it cannot be sent to market. Today in New York City, by actual investigation and pricing of stuff within the last two or three weeks, we find apples selling anywhere from $7 to $20 a barrel. Of course that is by the piece, by the quart, or a little basket with a hole punched up in the middle of it to make it look bigger. And what are you getting — $2.00 and $2.75 a barrel. I guess some of you would be glad to get $2.25 for what you have on hand.

The same is true of potatoes. Last week I was down to Dansville, and they were moving them at 25 cents a bushel, and some were being sold at 20 cents a bushel. Now how much are you making, raising potatoes at 25 cents a bushel? It costs us more to raise them on Long Island than it costs you to raise them here. Our Long Island potatoes have a trade-mark in New York City; there is a demand for them. They are paying to-day 60 cents a bushel for them at the loading station on Long Island, but there is no money in it for us at that price. We made careful calculation of it. I venture to say that very few of you have made that calculation. On Long Island it costs $110 an acre to raise potatoes. I do not know how much it costs you up here. We use a ton to a ton and a half of fertilizer to the acre. Our land is a good deal higher; it has a speculative value.

If you are going to calculate the cost of raising potatoes, you must take into account the interest on your investment, the proper proportion of your taxes, your insurance, machinery, and buildings. It means more than you think it does, offhand.

There is a false idea among farmers that their labor is not worth very much. I tell you there is no class of people in the world that have to know so much as the farmer — that have to be able to do so much, so many things, and do them well. For instance, the professional man in business — bookkeeper, or other capacity — does not begin to know as much as the farmer. The greenest thing on earth is the city man who does not know anything about the country.

RETAIL OUTLETS

What else are we going to do? After we have these terminals where carload lots may be unloaded in a proper way immediately upon their arrival in New York, if the shipments are not immediately sent into the retail trade, they will go into cold storage or general storage; or, if necessary, into the manufacturing plant, and there be put up in the right kind of way — in preserves, pickles, etc. I know that the stores are full of those canned goods of every kind. If that stuff comes to New York and it is good wholesome food it should not be wasted, and we propose to take care of that waste and save something there.

The next step is to have an outlet for it. I am sorry to say that we cannot depend upon those 30,000 retail dealers for that outlet. I suppose that some of them will come to us for it, but the business is in the closest kind of a trades union, you may call it. They are all hand in glove — wholesalers, retailers, commission men and all. The retailers are largely tied up with credit, and they cannot break away. They would boycott these terminals and the stuff would rot on our hands. What would we do then? And what could we do for these farmers if we could not dispose of their products? You can see there are dangers all along this line. We must have a retail outlet for that food.

It will be only the jobbers, wholesalers and dealers who will combine against us. The other stronger fellows, upon whom they are now dependent for their supplies, will compel them to boycott these terminals for a time. That will wear off in time; at first it will mean a struggle. But the consumers and producers in this state and in New York City can win, and they are going to win. They need leadership; they need to see a way to do it. When they know they have a responsible leader; that a system is going to be organized in their interest and for their benefit — and when the consumers know that as well as the producers — this battle will be won.

We expect to establish these retail outlets, so far as we can, among the people who are in the trade, but they will have to have different stores than at present. The food stores must be complete, stocked with everything that the housewife may want, so that she can buy her supplies for the day or the week right there, without going shopping — coffee here, fish there, groceries somewhere else, etc. We are going to have all those products assembled in one complete food store, and that store will be in a market district. Take, for instance, a district with a food store in the center of it, feeding 25,000 or 30,000 people. Here is another district adjacent to it, over here another district and over here still another, and so on, district after district until we have comprised the whole city of New York in those retail food-store districts. Deliveries will then be made only in that district from that store, and in another district from the store in that district. We will do away with this multiplicity of deliveries; we will do away with this expense of fifteen to eighteen per cent of the whole of the business done by a store in the cost of the deliveries of the stuff. Instead of having thirty or forty wagons on every block every day, there will be practically one delivery in that block.

You say that will throw a lot of people out of employment. So it will, very often. But this is not going to happen all at once. It will be a matter of slow development, and it will take years to do it, but we must have an ideal. Then we have got to work as rapidly and intelligently as we can to accomplish a purpose which we know is right. We will ultimately have a system of food distribution in New York City that will eliminate the present waste and expense.

I was in Ohio a little over a month ago, and I took a day off to examine the market system of Cleveland. I shall tell you one thing I found there, although I did not find the conditions ideal. In one of their old markets (I think they called it Central Market) they serve about 40,000 buyers on Saturday of every week — people who buy in that store. They have taken a census week after week there for a considerable time, and they have ascertained that they serve over 20,000 people every day. That one market feeds about 200,000 people, and on Saturday, their big day, they serve 40,000 buyers. There is not a telephone in their shop, and there is not a pound of stuff delivered from that market. Think of that saving! Everybody who buys foodstuffs in that market goes personally, pays cash and takes the stuff away. Of course they do not carry away a barrel of potatoes or a bag of apples, but generally the stuff is bought and carried away by the people who buy it. In that market the stands are rented out; they are not cooperative, but are rented to private individuals. That system in Cleveland saves about twenty per cent of what would be charged at the retail stores scattered around the city.

Somebody says, "You cannot expect housewives to take a market-basket and go and carry home her stuff." I say you can, and there will be no member of the family who will be more ready and willing to do what she can to help the household in the matter of expenditures than the housewife. I have been at a great many meetings of the Housewives' League, and I know the president of the league. The housewives declare they are ready to go, and are anxious to go, provided they are saving something.

As things are now, why should they go to market? There is no reason for doing so. They ring up the phone and say, "Send me over a loaf of bread," or some little thing or other, and it costs four times as much to deliver the stuff as it is worth. Is that good, American common-sense? Should we perpetuate such a system as that?

You are the producer. You do not care what they do with your produce when they get it to New York, do you? But, when they return the money for your stuff, you do care if you do not get what you know you ought to get for it. The consumers care too, because it means money in their pockets.

I say to you that at least ten dollars (I think it is nearer twenty) can be saved to every man, woman and child in New York City every year under a proper system of food distribution. If a family consists of five, at ten dollars apiece, that is fifty dollars. The stress of living in New York City is a great deal harder and heavier than it is in Albion, I can tell you. You may think they live in fine houses and have amusements and all that sort of thing. I used to think so, too. I thought New York City would be grand. It did not take me long to get over that dream. I got over it, but I stayed there; I was getting along fairly well. But I never enjoyed it after the first year or two. I know that the poverty and suffering and economies in New York are appalling. I know the people in New York City will thank God for any system which will make living any less burdensome than it is now.

COUNTRY ORGANIZATIONS REACHED

The thing I want to say to you is this: You have got to help build up this system of economical distribution in our large cities and in you own local communities. One of the ways to help is to organize yourselves, in these shipping districts, for selling the produce. I am not going to talk to you about cooperative buying societies. That question is all right in its way, but it is not a big question. The big question, in the country, is the organization of selling societies — farmers' cooperative selling societies. That is where you have fallen down. Farmers in this state as well as over the entire country are too independent. Maybe when you are starved you will cooperate. That is what happened in Denmark and in Ireland. That is what I am preaching to you now. Cooperate in getting your stuff together and grading it right and packing it right, and shipping it in carload lots. That last feature means a saving of expense in transportation.

Grading is one of the greatest things that I can talk to you about. You do not grade right; you do not grade honestly. Neither do I. I raise cauliflower down on my farm, and I put the little heads down in the bottom of the barrel. Where do you put the little apples, on top? That is where they belong — in the middle of the barrel and on the top, if they are graded as No. 1. That gives them a trademark. A cooperative society is the one to guarantee the products to be just as represented, so that when they come down to our terminals in New York they need not open that package. We guarantee it because we have their guarantee. And you will get more money for your product. I know because I have tested it.

I have packed my cauliflower properly, with the best heads in barrels marked "No. 1," and culls in other barrels marked "Seconds." I have sent them to a commission man and every barrel brought the same price. The next time I did not take that pains, because I knew I would get the same price. My neighbor was honest, perhaps, and packed his goods, and I was dishonest and did not pack my goods. He saved out his culls and gave them to the cows. I sold mine and got as much as he did.

Dishonesty is forced upon us. You know it as well as I do. When we get our returns we say, "What is the good of being honest?" We know the poorly-packed product brings the same as the No. 1. That is the system which makes honesty of no avail. We are going to have a system where honesty will avail and prevail, and where it will be the best policy. And I tell you, my friends, we must have these cooperative shipping societies in the country, where an expert will do the grading and packing. You cannot trust yourselves to do it; I cannot trust myself to do it. The best I have, of course, is No. 1, but compared with other stuff it might be worthy of only grade No. 2. It ought to be marked in a common packing-house and it ought to be marked by an expert. It is being done by some up here in your section, I know, and I am not telling you new things. They know goods honestly packed bring the money. They know that individual growers cannot trust themselves, the best of them.

I am a great lover of the country and the farm. It is a business to make men the happiest in the world, but one cannot be happy if he is always in debt. We must make farming more profitable, and then it will be more attractive. We cannot live on sunshine and air. We want the result of our labor, and we want it in cash. We want to know, when we come to the end of the year, that we have a bank account bigger than it was last year — and that is what we are working for in this department.

MR. VAN WAGENEN: It has been a long, interesting day. We have been wrestling with problems of crops and cattle, and now, for a time, we have been talking about the probability of the farmer getting rid of his products and securing more for his comfort and independence than he has in the past. With all due deference to every one else who has spoken today, I really think the finest thing of the program is to come, because I hold that the farmer himself is greater than the farm, and that the finest thing on the farm is not the animal in the barn, but the people in the house. Also, because we need higher ideals of what life might be.

I take great pleasure in introducing to you a woman whom you already know, and whom you will welcome, I am sure — Mrs. Morgan.

MUSIC AND SONG

MRS. ROSE MORGAN, NEW YORK CITY

Farmers' Institute Lecturer

The mission of the ideal woman is to make her whole world homelike.
Frances E. Willard.

Every woman should begin in Eden, should have its blest traditions to return to, its holy places and things on which an eternal consecration rests.

To do work on which an eternal consecration rests is the truly successful woman's work. What form shall that work take? The reply includes the answers of all of us who attempt to reply, and there are none of us who do not.

Every woman of us here stands for a woman's work. There are times and places, when, looking about us, we see idle women of the so-called idle rich and the pleasure-taking classes. In them we seem to find women who do not work. More often than not we do so because we do not know them nor the demands in their lives nor what they accomplish as the result of self-investment. Varying standards as to forms of work need not belittle quality nor worthiness. If the "eternal consecration" of the worth while rests upon the individual conscience of the worker that conscience will speak out. Its sum-total of rewarded effort will allow it to say — "You are one of the world's workers, you are a 'woman who works.'"

Personality, present and past environment, special training, experience, have a governing share in determining the work path of all of us.

GREAT WOMEN LEADERS

Notable examples of great working women appeal to us in proportion as we understand and reply to the expressed personality of those women. They lead because they are understandable. Through death they may even seem to slip out of the world of work and yet they live powerfully, still speaking, still leading.

Great personality and great self-investment combine to provide for us great women workers, around whom other women gather, understanding, responding, supporting, following. The grouping is natural. The woman who makes the appeal through a conviction of high standards and ideals brings the personality to bear which induces self-expression from hundreds of other women with similar standards and hopes. In this way woman's work through a "cause" has been developed. We remember Susan B. Anthony and Frances E. Willard as two of the greatest women leaders, each in a distinct cause. Sincere in their aggression, each represented and worked from personal conviction; each called thousands of other women to self-expression.

Women's work among and for women, as originally led by Miss Anthony and Miss Willard, is today women's work in and for the whole world. The two great issues, equal suffrage and temperance, are goals as certain to be reached as there are women to continue the working-march forward to the long sought success.

When I was a young girl I once found myself seated by a little lady whose simple graciousness disarmed girlish self-consciousness. "And why are you here, child?" she asked. "To sing," I replied.

"Oh, and what are you to sing?" The planned-for songs were named. With a sweet, thoughtful look — "Sing my song, child." But I knew not that little lady nor what she asked until she quoted to me:

> In the beauty of the lilies Christ was born across the sea,
> With the glory in His bosom that transfigures you and me;
> As He died to make men holy let us die to make men free.
> His truth is marching on.

Then, girl though I was, I felt that I too, along with the other women, had been called to Julia Ward Howe and her great marching song. How many times since has her call to women for true work been an incentive and a benediction.

HOMEMAKING WOMAN'S CHIEF GLORY

'Tis the homemaking charge of women that is their unique glory. This responsibility may develop into self-expression that calls for the mothering of great national issues. Necessary and worthy though such work may be it cannot call upon itself an "eternal consecration" holier than that which rests on her whose "charge to keep" is in the simplest home. To make home the stronghold of these traditions is noble work for the noblest of women.

We are told that in life we have the "choice of the tread-mill of the eternal grind or the path of the eternal journey." Really to have chosen is to have consciously accepted the personal place of woman's work which no other woman could have filled. A sense of permanency rewards the day's routine. Simple work, hard work, and monotonous work is dignified by purpose in work.

The vision of the glory of the homemaker fades or is missed altogether when homemaking for permanency is not the work text. We should realize the great purpose in homemaking — think of it as women's work of highest privilege. My own special appeal to this end is that the song that has ministered to me as a "blest tradition" and experience, binding me to the old home and all that that means, as no other factor in my life does, shall be an experience possible to you and to your children.

SONGS WITH PERSONALITY

All good songs carry with them aesthetic value which is impersonal. Their poetry and music are art and therefore beauty and power. But it is the personal, the worth of the personal touch and permanency of impression gained from the far-seeing home ones — that is the song that has the power to bind childhood, manhood and old age.

I have told you my personal reasons for wishing to bring to you this message regarding old songs. My mother is, for me, *my* mother and my sister, *my* sister. But we are speaking for each other when we quote them and their memory. You, too, know a sister and a mother. Their power as women who " worked hitherto and yet work " is the immortal power of those great ones who " being dead yet speak."

Such work can be told in the old song and it in turn carries us back in memory; carries us forward in incentive and hope. Life becomes all of one piece, Eternity here and now, and work — woman's work — her great joy in living, upon which she may expect the Eternal's benediction.

SEVENTH SESSION

Wednesday, March 17, 9:40 a. m.

Mr. Van Wagenen: I believe you will agree with me that so far our meetings have been run almost exactly on scheduled time. With very few exceptions, no man has been cut short of his allotted period, and no one has been allowed to run over to any extent. Mr. Bennett, of Ithaca, will now take up "Fruit Conditions in the West."

FRUIT CONDITIONS IN THE WEST

E. R. Bennett, Ithaca, N. Y.

Formerly Agricultural Expert With Rock Island Railroad

Mr. Van Wagenen saying I am from Ithaca may give a somewhat false impression. I do not know that I can correct it very much, because I do not know where I am from. I am at Ithaca for a short time, and for several years I have been in the west, at various places. In fact, for the past two years my work has been such that I have been all over the United States, anywhere from Massachusetts to California, and have had some chance to see what was going on, and note a few of the horticultural conditions throughout the country.

My subject this morning is a little different from any I have before taken up. I hardly know what to say that will be of the greatest interest to you, because your interest is in New York fruit-growing rather than in that of Colorado. In Colorado fruit-growing, it is simply a matter of competition. So I shall, for a few minutes, take up the matter of fundamental conditions in the West. Professor Hedrick has had experience in the West, and he may disagree with me, but his experience has been different from mine.

Fruit-growing in the West is hardly to be compared with the fruit-growing in this section. You have the old family orchard; they have a little of that in the West but not so much as you have here. In the early days — in the seventy's and eighty's — they said they could not grow apples there; at first they could grow only stock. Then they began to raise other things — vegetables and grains — and grazing gave away to extensive farming. Then, after a struggle, it was found that fruit could be grown in Colorado, Utah and New Mexico, and in parts of Idaho and Wyoming and those adjacent states. When they found they could grow apples there, and could grow them so well, there was an epidemic of apple growing.

APPLES IN COLORADO AND ARKANSAS

Fruit-growing in the West is scattered, and is confined to small areas. For instance, in south-western Colorado there is a rather unique apple district know as Montezuma county; that is high altitude, largely. If you were in some places in the West they would tell you that apples could not be grown at an altitude of 5,000 feet. Yet the best fruit orchards I have seen there are 7,000 feet or above, and that is quite high. But they are far enough south to offset the altitude by being warmer.

The McElmo Cañon apples have been a wonder all over the world. In that district, when they began to run ditches across the desert to irrigate their lands, they found depressions in the land, which, when a survey was made, were found to be old, prehistoric canals. At one time there was irrigation there, and they were on the site of those old canals made long before history began.

Then there is the district that you hear more about than any other, known as the Grand Valley district, which is quite a large area of land, and where they are growing a greal deal of fruit. They have boomed that district until their ideas are pretty big as to the possibilities of growing fruit there.

There is another district — the Gunnison Tunnel district — which consists of 100,000 to 200,000 acres, and takes in Delta, Hotchkiss and Montrose.

On the east slope there is the Cañon City district, in the Arkansas Valley. In the Rocky Ford Valley there is another district, and then there is the northern Colorado district — all separated by considerable distances. This has made it difficult, because each district is more or less jealous of the others, and they have not been able to get together. That is a thing that is holding back the development of that country.

ILL EFFECTS OF A BOOM

When they began to find they could grow good fruit in the West, they began to develop it as a fruit country, and as a result have sold the land to newcomers — land where apples never should have been grown. The result, as you can imagine, has been disastrous, and that is one of the things that is hurting the West at the present time — simply the result of speculation. When I went West ten years ago they were paying from $400 for raw lands up to $4,500 an acre for orchards. That is too much. Anyone who is not acquainted with conditions out there can hardly tell the difference between land that is actually worth $500 an acre for apple growing and land that is worth nothing whatever, for this reason: the soil out there, while rich, is underlaid with another soil which is not worth anything at all. The average soil in the West contains potash and phosphoric acid, and by growing alfalfa there they never use a commercial fertilizer in any way. Manure supplies the needs. The lands are not fertile at all until they have been in manure or alfalfa. The soils there are composed of lime, potash and salts, so there is plenty of fertility; but they have had to find out that they have to make it available. They found, when they plowed the sage brush and put in alfalfa, they could double their yield by simply getting their plant food available.

Some of the soils are shallow. There are many places in that district where they have sold land and put orchards on it, and the soil may not be over a foot or two feet deep. The soil looks very nice on top, but when you dig down anywhere from six inches to twenty feet, or maybe forty feet, you will find a great depth in there of white material called "gyp." In many cases it is not gypsum, but the arsenic in the subsoil that is killing the fruit trees.

I have a claim myself in south-western Colorado, and where the water has washed off and I dig up my soil, it is just as white as chalk. It is chalk, pure and simple, and nothing will grow in that. You might as well have solid rock.

That is the trouble in the West — they have plenty of land for orchards with plenty of marl. The trees begin to die after they have been planted for a few years, and the orchards go out. There are a great many orchards through the western states on that kind of land. Close to one-half of the orchards of the West have been put on land that never should have been put in orchards whatever. I believe that is also true here. In many places in the West they have been pulling out their orchards. They believed that all the land in that community was good orchard land. One section may be good and one alongside of it poor. Because a quarter-section may be growing good apples is no criterion whatever that the next section is good; it may be just the opposite.

In the mountain districts in the West no two places are alike. I know one place that has been growing 250 bushels of potatoes on an acre for years, and $300 an acre has been refused for that land. That is good land for potatoes. The next land to it is worth nothing.

ORCHARDS TOO CLOSELY PLANTED

Another mistake they have made in the West, for which they are paying now, is that of planting too closely. They thought because the trees were short-lived they could plant close together, and nearly all the early orchards were set sixteen feet apart each way. They have kept holding them back, and yet it is very hard to cut out the rows to give them space enough. You know that if trees become any age, sixteen feet apart will crowd them. Thirty-two feet probably is a good, standard distance; they should not be less than that.

VARIETIES

So much for the western conditions in orcharding. The varieties there are just about as they are in other districts. They started in with a little of everything, and then they began to put in Ben Davis. That is used three times as much as the other trees. I expect that in the West, in the northern states, 30 per cent of the trees are of the Ben Davis type, and it is beginning to have its effect. But every variety may be found there. The later orchards, at the present time, are taking the varieties which are adapted to that community; the Jonathan, Winesap and Rome Beauty are good. Certain varieties are adapted to certain districts. In your district the Baldwin is about as good as can be found, perhaps. In the Southwest — in Arkansas, Missouri and Kansas — the Winesap and the Jonathan are good, and if there is any place where the Ben Davis is worth growing it is there. Apples grown in this section cannot be grown in the Colorado districts profitably. I do not know what makes it, but there is a change in the flavor. Perhaps the high altitudes there affect the flavor. Consequently, the Baldwin grown in that section is about as tasteless as you could find; also the Roxbury Russet. The apples in Washington and Oregon, as a whole, do not have the flavor that your New York apples do, and that is in your favor. If they compete they must get the flavor. The Jonathan as you know is quite sour, and it is adapted to their conditions there.

When there is a wind-storm in Colorado the limbs of the trees break off easily. The same is true of fruit — the soil makes a delicate tissue. When it comes to cauliflower and cabbage, this same condition gives them a chance to grow the finest in the world. Better celery is grown there than in any other place I have seen in the country, on account of the high altitude. Fruit grown under these conditions is toned down; consequently they have to select a variety that will stand this. The same thing applied to the cherry makes the cherry of the West probably the best in the world. I do not believe that even Professor Hedrick can grow sour cherries that can compare with the cherries grown there. For canning, they are as fine as anywhere in the world.

INSECTS ARE SERIOUS PESTS; MORE FREE FROM FUNGOUS TROUBLES

Most eastern people have had the impression that western fruit is free from troubles. That is a mistake, because there is no place I know of where the codling moth is so prevalent as in the West. The climate has made the conditions right for the codling moth to grow. For instance, this last year the director of the station at Fort Collins found eleven trees that had not been sprayed for two or three years, and thought it a good opportunity to obtain some data on the codling moth. The trees could not be called mature. He had a boy band the trees to catch the larvæ. How many do you think he got? By actual count, 3,300 worms in the eleven trees. That would be practically 50 per cent of the codling moths that would be developed on those trees.

They are free from many of the fungous troubles you have here — not so much in the Northwest, but in the inter-mountain states. They have no apple canker, apple scab, or rust. The blight is more destructive there than here, probably because of the excessive growth which is brought on by too much irrigation and great fertility. Both pears and apples blight very badly. Two or three times I have been called to look over blighty orchards, to find out the trouble. More than half the leaves and twigs had begun to rot, and were taken right off in the spring by the blight. It does not work so much on the new growth as on the fruit twigs coming into blossom. Blight is always found in the West, but so far as the fungous diseases are concerned, they are more or less free from them.

Eastern growers can never hope to grow apples of as clear skin as the West produces. There are certain varieties that approximate the looks of the western apple, but they have not that waxy, clear skin found in the West. Where quality is concerned, you have the advantage.

FAILURE TO REALLY COOPERATE

The fact remains that for the last two years, in 1913 and 1914, they have not been making a success financially of orcharding. A great number of the trees have been pulled out this last year, and more of them have been changing hands on mortgages. This is deplorable, and most of it is due to lack of cooperation. They do not know how to cooperate. They have organized — and here is a lesson to the people in the East. We find they have thirty-three organizations selling apples in Colorado. Two years ago they were discussing this trouble, and it came out there that these thirty-three associations were competing with each other, and one man would be in two different associations and would be competing against himself. They were spending something like three thousand dollars in telegrams alone in each association in selling their produce, which means a total of $99,000. That is quite serious competition, and it is one of the troubles they have there. The mere fact that they have those organizations makes it harder to get together, because it means that several of the officers of the associations are making a living out of the work. Those managers and officers drawing salaries will oppose any cooperation. They do not want to lose their positions, and if they combine into one organization they will. As it is, it will be a difficult proposition to do that. None of these fruit districts are living unto themselves; they are often bidding against each other. Every district in the Northwest, even to California, is competing in this apple business, and I believe there are several vital factors concerned. I have been making a study of it and have seen the conditions.

THE BUSINESS NOT PROFITABLE

The only way we can realize this situation is through statistics. If you remember the '95 and '96 crops, we had then between 60,000,000 and 65,000,000 barrels; that is, according to estimates of the United States. There were probably more than that, because in those two years it was hard to sell them. I sold apples at nineteen cents a bushel, and was lucky to get rid of them. After that the production kept reducing, because of various conditions (mostly a matter of not getting good apples), until we get down as low as 23,000,000 barrels in some years, and it was not until 1912 that we reached the former figure again — that is, apparent over-production. We did not have so many more apples in 1912 than in 1895 and 1896, since the population had multiplied in that time, and the transportation facilities were better than formerly. Yet we had as much trouble to sell apples in 1912 as in 1895 and 1896.

COMPETITION WITH OTHER FRUITS

If you go back to 1895 and 1896 you will find that the banana importation was about 2,000,000 bunches. I could not find the amount of oranges and grapefruits sent in, but it amounted to a few hundred cars. At that time many of you were probably not eating oranges and grapefruit. In the meantime, in 1913, the importation of bananas in this country was 37,000,000 bunches. I do not know how many bushels or boxes of oranges and grapefruits were sent in. The California Fruit Exchange, that year, handled about 35,000 cars. We are eating now between 70,000,000 and 80,000,000 bushels of tropical fruits, and probably more than that. In other words, during the last two decades, while apple-consumption has not been growing (it is not very much more than it was then), the grapefruit, orange and banana consumption has multiplied nine times. In other words, we let those fellows take our market, and they are taking it now. Why? There are three things responsible.

VALUE OF STANDARDIZED PRODUCTS

A few years ago there was a time when the California fellows were not able to sell their oranges, and they were rotting on the ground. It looked as though the whole industry was going to pieces, and they became alarmed. They said, "We cannot stand this; we must find some way to get our oranges and grapefruits on the market, and reach the consumer." The result was that they organized and combined the locals. If I remember correctly, there are 127 of those locals in California organized in selling under one agency. What has it done for them? In the first place. it has standardized their products. Our trouble today is lack of standardization. When in Denver one time a man said to me, "What is the reason that the Hood River produce can go into the market without any investigation at all? Everybody in Colorado is buying it." It is largely a matter of education.

The only way to standardize is to organize and establish a standard, and make people pack correctly. When a consumer buys a box of those California oranges, practically all of the oranges are the same. And they have advertised. They have women working on various recipes, and they are publishing them. They are inducing many people to use lemon juice instead of vinegar. We are simply standing still and letting things go, and the California fellows are pushing their products and inducing people to buy them. One reason is because they have organized and are able to work together, and they are getting something out of it. A year ago, near Los Angeles, they were selling lots in the desert for $30 a lot, and I would not give them thirty cents for them.

HOME-GROWN APPLES POORLY PACKED

Another thing — say that I am in Ithaca and I want to buy some apples. The dealer will take me out and show them to me, and in nine cases out of ten they are marked "Hood River" or some other western brand. When I say that I want home-grown apples he will show me crates of them — no two apples the same.

In fact I have several times picked out several pounds of fairly good apples, and not one really a show apple. They are simply everything put together, and most of them from old trees. That is our trouble — apples from these old trees, and putting them up in bulk. One bushel of those poor apples will stay on the market longer than one bushel of good apples; you know that is true A poor apple will last a long time. As a result, instead of eating the apples in our cellars, we have been buying grapefruit and oranges.

IMPORTANCE OF APPLES OF GOOD QUALITY

A few years ago, when we began growing the apple as a business, we found that we wanted an apple that would make a big production and would look good. As a result, the last twenty years they have been planting the Ben Davis. Farther north than this they are also growing Ben Davis. What has been the result? People will buy them once or twice, but after they get them home they say, "I do not believe I shall eat apples any more; they do not taste as good as they used to. I shall just buy oranges." We have been putting poor apples on the market. The apple business should be a good business. We should be using, at the present time, more apples than were produced in the United States last year.

We must put in varieties that will be of good quality when they are well grown. Of course the San José scale and other diseases are eliminating the trees. We must give up the production of poor stuff, and organize so as to standardize. Then we must stick to that standardization. When we say it is grade 1, or whatever it is, let us stick to it, and advertise it as a good apple.

GOOD PROSPECTS FOR INTELLIGENT APPLE GROWING

There have been millions of young trees set out the last few years throughout the United States, and many in the Northwest and in Virginia have not been bearing yet, but a large part of the trees are doomed because of being set on poor land. My opinion is that if we put out the good article, there has never been a better prospect for setting out young orchards than there is today. Ten years from now a man who has an orchard in bearing will have a valuable asset. But we must run this thing on a business basis.

just as those in the Northwest have done. They have organized. As soon as the canal is opened a large part of that northwestern produce will not come this way; it will go on to the Old World. But a great many orchards there have never been bearing; of a million trees set out, not more than half of them will bear. There is hardly an orchard in the Missouri Valley. They may be bearing now; but, if you look at them carefully, there is hardly a tree that is not diseased with canker or otherwise, and it will never bear a full crop.

My object, so far as possible, was to start a discussion as to the general conditions that we are facing. While we have many details as to pruning and spraying, etc. to take in, the question, I believe, is, "Will it pay me to put my orchard in good condition, and what shall I set out?" Orcharding is not a matter of New York State alone — it is of vital interest to the whole United States. Even more, it takes in the other countries.

In your work here last year you made an effort at standardization. It seems to me that we had the wrong end to. I do not believe any one state should legislate alone. You are working a hardship on most people, because the problem is an interstate problem. We should have national legislation rather than state.

DISCUSSION

QUESTION: What about other fruits in the West; especially the peach in Colorado? We grow a great many peaches in New York, and find competition from the West.

MR. BENNETT: They are so localized there that I do not consider them of much consequence. The last two or three years they have lost money on their crop. I think the peach is gradually going out of the proposition; I do not think it is a factor. The cherry is a better proposition there, in cans. The peach crop (until they do can them) is not paying. There are more peach orchards being pulled out than apple orchards. You need not fear much competition in the sale of peaches.

QUESTION: Are they doing anything with the by-products of apples?

MR. BENNETT: Very little. That is a thing they have recently taken up there. A short time ago one of the papers asked me to write an article on handling the by-products. In my opinion, we have this proposition, which I did not mention before: In the West, because of the high cost of production, and because of their distance from market, they can grow only the high-grade fruit profitably. When they sell a box of apples at less than 67 cents they lose money. The Ben Davis they have had to sell at 50 cents, and have lost money. With their Jonathan, Rome Beauty and Winesap they have to prune their trees and cultivate them, and that is what pays. When they get 95 cents for fancy fruit they make money. They cannot grow apples as cheaply as you can, and you cannot grow them as cheaply as in Missouri, for that matter. Consequently, I think their problem of by-products has been eliminated. They will not have them in the first place. So far they have done almost nothing in that line. If they make the cider they cannot sell it.

QUESTION: Is the McIntosh Red a good market apple?

MR. BENNETT: In certain districts, yes. It would not be in the West, except in the Northwest. It is a fall apple. The McIntosh Red is sold for its flavor and delicacy of tissue.

QUESTION: Are they not pulling up a great many orchards in the state of Washington?

MR. BENNETT: I do not know much about Washington. Many are threatening to. They will have to if they do not get more money for their apples.

MR. VAN WAGENEN: How much of truth, and how much of fiction, is there in the oft-repeated statement that New York State apples, so far as flavor is concerned, are far ahead of the western product?

MR. BENNETT: That matter of flavor depends upon the variety and location. Your apples have more flavor than in the West; I do not think anyone will dispute that, for a given variety. If you have an apple that will stand toning down as will the Jonathan. I think the Colorado Jonathan is the best apple I ever ate. But when it comes to growing the Baldwin it is different, because it does not stand the toning in the West. Your Wagener is a good apple, and your Baldwin, and the King, but those apples are not good there. They have put apples on the market that you say are insipid and of no account. That is not true in all cases. When they are packed and shipped to you, they are not so good as when picked from the trees. In Colorado we lose quality in shipping.

QUESTION: What is the usual period of transportation of a car of apples across the continent?

MR. BENNETT: I do not know, but I should say it would take at least two weeks. If they are rushed through on special trains, there is no reason why they should not come through in that time.

QUESTION: Are they developing storage in the mountain states?

MR. BENNETT: No, but there has been talk of doing that and rushing the apples to those storage-houses through Marshall Pass by tunnel. In fact, in the tunnels of the mines they have kept in good condition two years in the high altitudes. But that has only been talk, so far.

QUESTION: Do men in the West cool their apples with ice on their places, like refrigerating their cars for apples and fruits?

MR. BENNETT: I do not know of an orchard storage-plant that uses ice at all. Most of them will rush the stuff through to Denver and put it in storage there, and others to Kansas City. The apples should be rushed right from the orchard to the storage. I think a storage house on top of the passes would be good.

QUESTION: What are the apple conditions in Missouri? Are they setting out fruit?

MR. BENNETT: No, they are not setting out fruit at all. A few years ago there was an epidemic of planting there, but a great many of them have been cut out the last few years because of the fungous diseases and cankers. Their supply of apples will be very short in that country unless they start to plant again.

QUESTION: Will the Pacific Coast tree live to be as old as the trees in western New York?

MR. BENNETT: No. The oldest I know there is forty years. When the roots go deep enough, they reach the marl, and then the tree begins to become bad. They bear younger and grow faster, but never reach the size — as a general proposition — that they do here, and undoubtedly never reach the same age. Here and there you will find an orchard, as in Cañon City, which is on made land — washed land — and there the trees are old and perfectly thrifty, and may live to be sixty or seventy years old. Everything west of the Mississippi is not so long-lived as in the East, and I do not believe they ever will be.

QUESTION: How about fungous troubles in the West?

MR. BENNETT: They do not have much fungous troubles in the West, except in the coast states. The blight and insects are bad. There are a few fungous troubles and some mildews, but those that you know here they do not have there at all. Of course there are fungi of other crops, but the most of the orchard fungi, outside of the mildew, are not bad. They are troubled with the red spider and other insect pests.

QUESTION: Is the red spider easy to kill?

MR. BENNETT: No, it is not easy to kill. You know the red spider and brown mice are found in a light, dry climate. In those arid countries they become very injurious.

QUESTION: What do they fight them with?

MR. BENNETT: Sulphur mostly, or lime-sulphur.

QUESTION: Does the blight on apples and pears die in time?

MR. BENNETT: So far as the epidemic is concerned, it does, but it is impossible to blot out blight entirely. One may go in an orchard and find what is called a "hold-over" blight. It does not grow very much, but in the spring the gum oozes out of it, the insects eat that gum and inoculate the blossoms with it. If the conditions are right to develop this, an epidemic of fire blight in the trees follows. Sometimes the insects suck the new growth and inoculate it. They are worse some years than others.

QUESTION: Is there a treatment?

MR. BENNETT: I know of none that is successful. It can never be entirely cut out. I saw a man near Ithaca last fall cutting out the blight from all his trees. He was wasting his time. It was in the body of the trees, and that part cannot be reached. He was just getting the twigs.

MR. VAN WAGENEN: I think there is no question which is more attractive, and in which we are more interested at present, than that of whether we have or have not an over-production of fruit. And I feel there is no man you are more glad to listen to than Professor Hedrick, of Geneva.

IS THERE DANGER OF AN OVER-PRODUCTION OF FRUIT?

U. P. HEDRICK
Horticulturist, New York Agricultural Experiment Station, Geneva

This is the second, and I am not quite sure but that it is the third time I have discussed this question in Albion. I hasten to say that I am not a prophet and will not try to answer the question as to whether there is to be an over-production, but will confine myself to the things we are to do to prevent over-production. Let us consider just a moment, however, the question asked in the title. When we look at census figures, there is very little to indicate an over-production of fruit. According to the 1910 census figures, there were fewer fruit trees in 1910 than in 1900. So, too, the production of apples, and other fruits as well, is not greatly in excess of the production of a decade or a decade and a half ago. When you consider the quantity of fruit per capita in the United States, there is really a great deal less than ten years ago.

On the other hand, if we drop census-report figures and use our own eyes and our own information in regard to the numbers of trees of different varieties that have been set in the last few years, nearly all of us come to the conclusion that there are more trees now than there were a few years ago. Everybody is setting fruit in fruit regions, and there are many fruit regions now in existence in the United States that were not in existence ten years ago. It was not so long ago that New York had the apple market pretty well to itself. There were some apples grown in the middle-western states, but none in the far West. But, as all of you know, there has been a wonderful development of the fruit orchards in the inter-mountain and Pacific states, and therefore we must now compete with several distinct fruit-growing regions in the United States.

So the reason why I suppose you are wondering whether there is to be an over-production of fruit, is that you and I know that tremendous areas of all the different fruits have been put out in different parts of the United States, and are being put out. For even at the present time, with the past year almost a failure so far as apples and marketing conditions are concerned, nurserymen tell me they are selling a tremendous number of trees. I have been told that nurserymen are selling as many apple trees this year as in any one in the past ten years, indicating that men are still planting apples. The same is true of peaches and sour cherries.

We wonder, then, from our knowledge of the number of trees that are being planted, and have been planted, what will be the outcome when once these trees come in bearing. As I say, I cannot tell you; but I will instead take up, one by one, the several ways in which I think you, as fruit growers, can help to prevent overproduction.

NEW MARKETS

One of the first ways, and possibly the best way, is to find new markets. We have been finding new markets for some time, but there are still others to be found and to be developed. A great deal more fruit goes to Europe now than ever before, and I have been quite surprised to find, in reading the trade papers, that this year, when we thought we could have no trade with Europe whatsoever in marketing our apples, more apples have gone to Europe than last year. We have really had a wonderful trade with Europe in our apple crop. Of course the freight rate has been so high, and it has been so hard to get good prices over there, that not much money has been made in shipping fruit to Europe. Still, fruit has gone there, and if we can send it at reasonable prices in years to come, as freight rates come down — as they will do — we shall find Europe ready to take our fruits.

We shall find, too, that the Westerners, who have been competing with us with their fancy boxed fruit, will prefer to ship their fancy fruit by the Canal to Europe, where they can get a better price, and not come so much in competition with us in the East. So we ought to try to develop a market for our apples and pears, and possibly peaches, in the Old World. On the other side of the continent the Westerners are developing a very good market, and we can well hope that they will succeed in increasing it from year to year, in Asiatic countries. Some fruit goes to the Philippines, and the Japanese and Chinese are now taking some — in comparatively limited quantities, it is true, but considerable as compared with past years when they took none.

After all is said and done, the chief place to develop the fruit market is right here at home. We have the South and the Middle West, also the corn- and wheat- and hog-producing sections of the West and the cotton-growing sections of the South, where they cannot grow fruit with success. It is in these regions that we here in the East must develop our best markets for fruit, and with good fruit and better methods of distribution, we shall be able to find a market for larger quantities of apples, pears, peaches and plums than we have done in the past, in the South and Middle West.

BETTER STORAGE

Another thing that can be done in preventing over-production is to secure better storage facilities. We need a cold storage plant in every fruit-producing section of the state of New York where there is any considerable quantity of fruit produced. We have fairly good storage facilities now in comparison with that of a few years ago; but when we have a full crop, as in the past year, there are many who cannot find a place to store their fruit. Therefore, fruit growers should strive to secure better storage facilities for fruits — apples and pears, in particular. With better storage facilities we shall be able to hold our fruit longer, market it to better advantage, and secure higher prices.

We must have more knowledge as to how to handle fruit better in storage — in what condition of maturity to store, how soon after picking, and what temperature to keep the storage plant. We must know all the conditions that should prevail in cold-storage establishments to give us a good product with as little loss as possible. There is now considerable loss from scalding and from the development of rots and mildews in storage plants. Some one of our stations should take up these problems and work them out.

BETTER TRANSPORTATION

Still another means of avoiding over-production is to secure better transportation services. You here in western New York have been hard at work with the railroads to secure good train and refrigerator service during the fruit season. That needs to be done all over the United States. Here we have much better transportation service than have the people in some other parts of the state, or in some of the neighboring states. In fact, the transportation service for fruits in the southern tier of counties in this state is so very poor that no man should go into fruit growing in these counties, because he cannot handle his crop after he gets it. With the cutting down of the rates, then, and with less loss in handling the fruit on railroads through delays in shipping, fruit will reach the market in a better condition and at a lower price, and there will be some slight prevention from this source of an over-production of fruit.

BETTER DISTRIBUTION

Closely connected with the matter of transportation is that of distribution. Our fruits of the East are not well distributed — consumers cannot get them. If apples were as well distributed as bananas and oranges, we should not hear of over-production for years to come; but they are not. You can find good oranges, bananas and grapefruits in almost every village store. That is not the case with apples, even in our own state, and far more so in the South and Middle West. Our fruits are not distributed well. We have no central organization to direct the distribution of the fruit.

The California Fruit Exchange is probably the most remarkable organization in the United States, or in the world, for distributing its product. They have a man in almost every large city in the United States — in Buffalo, Rochester and Syracuse — who handles the product of this organization. They pay their manager a sum that enables them to obtain a first-class man. They found it impossible to market their oranges, lemons and grapefruits in California a few years ago. With the establishment of this organization, and with the hiring of a great number of capable business men and putting in a service whereby, through telegrams, they can find out the condition of the fruit market in every town in the United States, they can send fruits where there is a demand for them. They are able now to market their fruit at a profit, where a few years ago they could hardly market it at all.

Of course it is true that the orange and lemon growers of California have their wares and products all grown and produced in a comparatively small locality, and that they can organize better than the growers of deciduous fruits scattered all over the United States can possibly do. But, at least, the sections producing apples and pears and other fruits in the United States ought to organize better and have some central organization through which they can distribute their fruit. Possibly the development of the present organization in western New York may bring about something of this kind; certainly it is a step in the right direction. It should be helped and furthered. You fruit growers ought to help it along and develop it into some sort of an organization that will do the work. I know the grape growers in Chautauqua County have an organization which is helping them very materially in disposing of their wares. I know on Long Island there is an organization which helps the vegetable growers to dispose of their wares. All over the country we are finding that these organized efforts to dispose of agricultural products are of tremendous value.

So here in western New York, without wishing at all to find fault or to combat the dealers in fruits, I think that fruit growers can well help out any effort whatsoever towards organization in selling your product. If existing organizations are not what you want, try to make them what you want.

GROW BETTER FRUIT

Another way in which you can help out the general situation is by growing better fruit. There is a great opportunity to improve in the matter of producing and selling good fruits. People will buy and consume fruits everywhere in much greater quantities if they are good, and you will help out tremendously by putting good fruits on the market. For that reason the present fruit-packing law is a good thing for the state of New York. It has its defects. I think the amendments that will be made this year in Albany will be helpful, and another year there may be still more amendments to be made; but it is a step in the right direction, and fruit growers ought to support the law and do everything possible to get better fruits; through better fruits you are going to lessen the production very materially and secure a greater demand, at a better price, for fruits that are sold. It is welcome news that all the New England States have passed packing laws similar to ours. New Jersey and Maryland have also passed them. I hope that in a few years every apple-producing state will have a law similar to ours.

IMPORTANCE OF UTILIZING BY-PRODUCTS

Still another way of preventing over-production is to work the fruits — apples in particular — into by-products that have some value. Here, by the way, we have a great advantage in western New York over any other part of the United States which produces fruits. In years like the past one we can sell fruits with a little profit to the evaporators.

It has been my privilege to be on the Pacific Coast, down through West Virginia and Virginia, and up in New England this past year, and everywhere I have found apple growers wondering what they were going to do in the years to come, with the fruits that they could not sell — all admitting that the time had come when poor fruits could not be put on the market to advantage. All were asking questions as to how we managed our evaporating plants in New York. Only in western New York are we turning a considerable quantity of apples into vinegar and cider. Then, too, there seems to be a growing demand (very small indeed, but it ought to be built up and developed into larger proportions) for jellies and apple butter. In every possible manner we ought to use the "seconds," which cannot properly be packed, for by-products.

ADVANTAGE OF INTELLIGENT ADVERTISING

Another way in which fruit growers could help in securing a greater consumption, and thereby providing against over-production, is by advertising. The growers of deciduous fruits are about the only people, outside of the general agriculturists, who are not advertising their wares. Everywhere you can see signs in village stores of the "Sunkist" orange of California. But we have no organization in the regions where deciduous fruits are grown, as far as I know, for advertising in an efficient way.

Personally, I have been very sorry that the efforts made by some of the apple growers' associations a year or two ago towards securing a fund to advertise apples, by placing a stamp on each package or barrel of apples, fell through. It seems to me every grower of apples could afford to pay two cents each for these stamps to secure a fund for advertising the apple. This plan is likely to come up again, and let me urge you men who have apples to sell, to try to help out. I believe the fund would have been well administered and that it would have paid to so advertise the apple.

So I look with favor, too, and I think you should, upon the observance of Apple Day in the cities of the United States. I look with favor upon the distribution of literature telling how to use the apple; it will help. Every apple grower ought to feel that he can do something to advertise the apple and thus secure a greater consumption of this fruit.

PEOPLE ARE EATING MORE FRUIT

It seems to me that one of the hopeful things that has a bearing upon the matter of over-production is a change in the eating habits of the nation. A hundred years ago we were a meat-eating race. No one thought of eating fruit for breakfast; and fruit, for that matter, was little grown for consumption out of hand. The apple, for instance, one hundred years ago, was grown almost entirely for cider. A man thought but very little of having barrels of apples in his cellar. The industry of growing fruit for table purposes has come into being within the last hundred years.

The same is true of vegetables. Tomatoes, celery, lettuce, and any number of other vegetables that were comparative rarities not so many years ago are now articles of common consumption. We are changing from a meat-eating people — from a race that formerly lived on animals and the grains — to a race that feeds more on vegetables and fruits. This change, then, in our diet is a very hopeful sign.

GROW FRUITS AS A BUSINESS

Another way in which fruit growers can help to prevent an over-production is to specialize more closely in growing the fruits that they have elected to plant. I do not believe that the fruit grower can be a good, general farmer or a good dairyman; and yet I must qualify this and say that there is danger of too close a specialization. There needs to be a well combined mixture of specialization and diversification in order to have the best results in producing fruits. While I do not believe that a man owning a farm can well go into fruit growing and general agriculture and dairying and make a success of it, yet, on the other hand, unless the conditions are exceptional, I would not advise him to specialize on one fruit alone, as the apple or the peach or the pear — that is, specialize as a fruit grower; but he should diversify his plantings of the different fruits. It seems to me, in this part of the state, we have specialized too closely on apples and peaches. If we had a sprinkling of pears and plums, it would be more helpful to a region as a whole. I think the planting of the sour cherry, and perhaps the sweet cherry, would be helpful.

Where there is a demand for the small fruits, every planter ought to put out some small fruits. That would enable a man to fall back upon them in case of an over-production of tree fruits. It also helps out the work on the farm. If you can keep your men busy with some of the small fruits, and then lead up to apples, pears and peaches, your help is better employed. Of course it is not possible in all cases; it is not possible to have the right kind of soil and markets and get the help for all fruits. But where diversification is possible for the whole region (I am speaking now for western New York, and not for the fruit-growing industries of the country at large), it would be better if there were a somewhat greater diversification within the fruit-growing industry itself, and less diversification in the way of trying to combine a fruit farm with a dairy farm and with a general farm.

There is an exception to this. Wherever there is a judicious combination of fruit growing with alfalfa growing there are advantages. Alfalfa, because of the nature of the crop and the necessity of having a good forage crop on almost every fruit farm, works in well with fruit growing.

GROW FRUIT ECONOMICALLY IN ORDER TO SELL AT A MODERATE PRICE

Now last of all, there has been, and still is, in many parts of the state, a mistaken notion as to the prices one should get for fruit. We have heard so much about the high prices that Westerners have been getting for their boxed fruit, and we have seen it sold at such fancy prices that many of us have gotten the notion that we must have a higher price for our fruit; we have been told that we should pack in boxes and grow fancy varieties. I do not take much stock in this, for western New York. We shall be better off if we work for fair prices — pack in barrels, and try to get our product to the market so that people in general can buy and eat our fruit as they cannot possibly do the Western fruit — in other words, try to grow our fruit as cheaply as we can, and yet grow good fruit; send it to the market at a fair price and not expect a high price. I do not believe, except in a few locations and under certain conditions, that we ought to expect to grow boxed fruit in New York. We shall be much better off in growing Baldwins, Greenings and Northern Spies and in selling them at a fair price, than we shall be if we grow Jonathans or Spitzenbergs or other fancy fruits and try to get a fancy price. My contention is that we should be able to put fruit on the market for the common people at a fair price; and we should, for our best interests, try to do so.

You ask what a fair price is. Well, from the work we have done at our station for the past ten years in keeping accounts, I do not believe one can grow apples and make money at less than $1.50 a barrel. Whenever you sell apples much less than that you are losing money. As many of you know, in one of our experiments the cost of producing a barrel of apples under the best conditions during the past ten years was $1.29 a barrel. As a general rule, then, you ought to expect to get at least $1.50 a barrel to make anything on apples. Two dollars would be a fair price.

In order to sell apples at the price I have named and make sure of a fair profit and still get the product to the consumer at a price he can afford to pay, every fruit grower, for the good of the fruit industry, to prevent over-production, should cut every item he can in producing fruit. That does not mean that he is to neglect the orchard — letting it lie in sod, or failing to prune or cultivate or spray it — but he must study costs and find out how he can produce fruit at the lowest cost.

DISCUSSION

Question: In the "Rural New-Yorker" I saw a little article about making syrup. What do you think of that as a by-product?

Professor Hedrick: I read the article with a great deal of interest, and I do not see why syrup can not be made from apples. But whether it will compete with syrup made from corn, I am very doubtful; I am not looking for the production of syrup from apples that will compete with syrup from corn. The Germans, I am told, use apples in making denatured alcohol, but even then I do not think that will compete with denatured alcohol made from other crops. It would be very helpful if we could find more by-products.

Question: Does the price you gave us include the barrel?

Professor Hedrick: Yes, it included the barrel.

QUESTION: Would you advise thinning?

PROFESSOR HEDRICK: Under most conditions, yes. Certainly the peach, always, and under most conditions the apples as well.

QUESTION: What varieties would you recommend?

PROFESSOR HEDRICK: I should still plant Baldwins and Greenings and Northern Spies. This brings up the question of varieties as related to over-production. It seems to me that here in western New York, as I said before, you will be very materially better off to hold to the standard sorts, rather than to attempt to grow fancy fruits.

QUESTION: How about the Maiden Blush?

PROFESSOR HEDRICK: If you have a good market for it, it is sometimes very profitable.

QUESTION: How late in the season would you thin late winter apples?

PROFESSOR HEDRICK: I should say that apples should be thinned when they are the size of a large walnut, and not much afterwards. That would mean that most of the thinning would be done in July and August. I have not had much experience in thinning.

QUESTION: Would you use the shears?

PROFESSOR HEDRICK: Shears would be too slow. I do not know of anyone who uses shears.

MR. VAN WAGENEN: How do you feel about the hog as a market for the poor apples?

PROFESSOR HEDRICK: I do not know what effect the apple has on the hog.

MR. VAN WAGENEN: It is entirely beneficial.

PROFESSOR HEDRICK: Does the apple have much nutritive value in hog feeding?

MR. VAN WAGENEN: There are three classes of products which the agricultural chemist says are entirely digestible; that is, milk, root crops and fruit crops. For that reason, whatever total solids an apple contains is probably worth more a pound than most other total solids that we get hold of, and I am inclined to place a rather high value on apples fed to a hog. I make no pretensions to being an apple man or an orchard man, but if the hogs or sheep can roam through an orchard the entire season, the apple containing the codling moth and the railroad worm will be disposed of so that they will never do any harm. I know Professor Hedrick remembers very well the orchard back of Mr. van Alstyne's house. While that has not been cared for according to the standards of western New York, I have seen in that orchard a considerable number of hogs and sheep that were taking care of the apples the moment they fell, and I am wondering if that is not a good way of marketing the apple. That is my own personal opinion.

Mr. Bennett: Would that apply to green apples or only to ripe?

Mr. Van Wagenen: I feel that all apples, after they become reasonably ripe, are all right for the hog. A bushel of apples will weigh 50 pounds; in other words, there are 7½ pounds of total solids. And those total solids are of higher value than any total solids you will be apt to buy in a bag in the way of meal feed. This war has given us some new ideas as to the value of such products as we buy. The cereal foods and many of our products today are crawling up to $35 and $36, and some of them — brewers' distillery grains, for example — are above $40. I believe a man is justified today in saying that the total solids in apples are worth not far from two cents a pound; in other words, a bushel of apples is worth fifteen cents fed to a well-bred and well-cared-for hog. It should be fed, of course, with some other nitrogenous grain, because the apple in itself is not a well balanced food. I believe I could stand here and make a pretty good proposition of that hog.

Professor Hedrick: At times the hog will strip the bark off the trees.

Mr. Van Wagenen: The hog that strips the bark off is a hog that is confined to a narrow area. Of course I am aware that you immediately point the finger of scorn at me and say, "That is not a good orchard."

Professor Hedrick: They will gnaw the roots and do some damage.

Mr. Van Wagenen: I know your position — when you grow apples you grow apples, and when you raise hogs you raise hogs.

Question: Can you grow a cover crop in an orchard at the same time?

Mr. Van Wagenen: A few men are making a success of sod orchards. Mr. van Alstyne has some sod orchards which have gone ahead with marked success, and there are always some hogs and sheep in them. After a rain storm the ground would be covered with apples, and the hogs and sheep would take care of them immediately.

QUESTION: Would you advise planting Kings and Spitzenbergs in this section?

PROFESSOR HEDRICK: Not Spitzenbergs. They are not profitable, and I know we cannot grow them to compete with the western or southern Spitzenbergs. Kings are sometimes very profitable, and when worked on some other plant may make a very desirable variety. Kings usually bring a fancy price.

QUESTION: Would you advise any particular soil to raise Kings on?

PROFESSOR HEDRICK: The King seems to do best in a rather fertile soil.

MR. VAN WAGENEN: Professor Barrus is now with us and will take up his subject.

DISEASES LIKELY TO DEMAND THE FRUITGROWER'S ATTENTION THE COMING YEAR

M. F. BARRUS

Extension Professor, Plant Pathology, Cornell University, Ithaca, N. Y.

Gentlemen: In talking about the diseases of the orchard crops with which you are expecting to contend this year, I am at a disadvantage, because I do not know what diseases will develop. It is very difficult for anyone to say definitely what they will be, but we know that every year there are certain diseases which do come if weather conditions are at all favorable for them, and I shall speak of these old-timers in the short time which I have. If there are any others about which you wish to inquire after I am through, I shall be glad to tell you what I know about them.

These common diseases are, peach leaf curl, apple scab and fire blight. Each of them demands at least a half hour's time to discuss very completely. But I shall go over them very hurriedly, and possibly may not have an opportunity to discuss the last-named one. I am also embarrassed to learn that probably some of the men who are here now have spoken to you on this same subject, and I was told there was hardly any use of my repeating it. However, I feel that as the disease is apt to recur year after year, it will do no harm to repeat the subject.

You probably all know what peach leaf curl is. If you lived in this county last year you certainly know what it is, because it was very abundant on the peach trees then. You probably know that it is a fungous disease—that is to say, it is a disease caused by one of the lower plants, which produces spores. These spores are borne on the surface of the infected leaves and are then supposed to be scattered, lodging in the axils of the leaves and on the new buds, and remaining there in a dormant condition until the following spring, when, if the weather is favorable and a particularly rainy period ensues after the buds have begun to swell, infection takes place. If spraying is done after infection has taken place, it will be ineffective in controlling the disease.

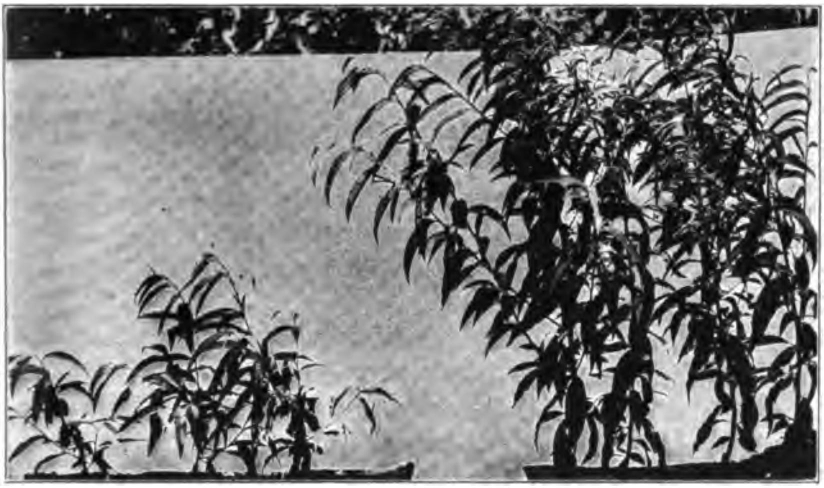


FIG. 546.— CARMAN PEACH BUDS. THE TREES ON THE LEFT WERE AFFECTED WITH LEAF-CURL EARLY IN THE SEASON AND MADE A STUNTED GROWTH AS COMPARED WITH THE HEALTHY TREES SHOWN ON THE RIGHT.

As I have been about this part of the state, quite a number of farmers have told me that they have made the applications as directed and still they have had the curl. Now what is the reason? I should have mentioned that it is necessary actually to touch the spore with some fungicide. For this, lime-sulphur or bordeaux mixture may be used, and other fungicides have been used with success. It should then be a very simple proposition to control the curl. There should never be any leaf curl if the farmer sprays thoroughly. But we must remember the thing to do; we must hit that spore with a fungicide before it has germinated and gone into the tissue of the leaf.

So if we control the disease we must spray before the buds begin to swell, and must spray thoroughly enough so as to hit all the spores. In just such a proportion as we spray thoroughly at such a time, will we be able to control the curl. It seems to me that the large amount of curl which exists now, and which existed last year through this region, is a testimonial to the ineffectual spraying which most farmers did.

QUESTION: Which is the better spray, bordeaux or lime-sulphur?

PROFESSOR BARRUS: Either will control. Some think bordeaux is better. If lime-sulphur will kill the spores of the fungus, bordeaux could not kill them any deader.

QUESTION: How about carbolic acid?

PROFESSOR BARRUS: That will probably kill them. I see no reason for using it, however. The lime-sulphur solution should be used to kill the scale, of course. I do not know whether all of you have to spray for scale in this locality. Thorough applications for scale should control the curl at the same time.

QUESTION: If the mixture should freeze before it was dry, would that make any difference?

PROFESSOR BARRUS: If the mixture hits the spores it should kill them at once.

QUESTION: Where do these spores come from? Why do you not have them this year and have them next year?

PROFESSOR BARRUS: Somebody else has them. I venture to say that if we look carefully on some of the varieties, we should find curl present. When some curl is present and no spraying is done, there is a sufficient number of spores produced to bring about a general inoculation. I think where you do not observe the disease you will not have so much curl the following year. The year before last there was considerable of it, so that the spores were produced in large amounts, were disseminated to the buds, and a general infection resulted. I should expect that the same would be true this year. There was so much curl last year that a large number of spores were produced. These are now on the surface of the buds, and will bring about another infection if weather conditions are favorable. The spores must be moist at the right time or they cannot grow. They may infect a few leaves during a dry spring, enough to carry themselves over, but they will not bring about a general epidemic.

QUESTION: Would you advise spraying now?

PROFESSOR BARRUS: Yes; any time, now.

QUESTION: Isn't it possible that there could be enough disease present and yet not curl the leaf?

PROFESSOR BARRUS: If the fungus is present it will curl the leaf even if the infection came from a single spore. Sometimes just the tip of the leaf will curl, or a little at the base, and in that case we may not notice it. But these diseases are always present, and they become very common only in seasons that are especially favorable for them.

QUESTION: Is it desirable to spray now, when it is freezing?

PROFESSOR BARRUS: I do not think so.

VOICE: Elbertas will curl, and others next to them will not.

PROFESSOR BARRUS: Certain plants are susceptible to certain parasitic organisms. We find that in all plants. Some varieties are more susceptible to the organisms than other varieties of that same plant. Just what this resistance consists in, no one knows; we only know it exists. It is a question in itself, and one too broad to discuss here. I simply say that we know that certain trees are resistant — perhaps not absolutely immune, but quite resistant to peach leaf curl, but I cannot tell you the reason.

QUESTION: Would it answer to spray in the fall, after the leaves fall?

PROFESSOR BARRUS: I cannot answer that with certainty. We hope to have more data on that question another year. In 1913 some growers sprayed their orchards in the fall; among those some have reported that they had no curl, and others reported that they did have curl, although they sprayed in the fall. Those reports are not very reliable, inasmuch as a great many men sprayed their orchards last spring and yet had the curl. You must hit the spores. I should expect, from our surmise about the way the organism passes the winter, that spraying in the fall would be better. But there are other phases I do not understand sufficiently now.

QUESTION: Wouldn't the spores be on some other place except the limbs?

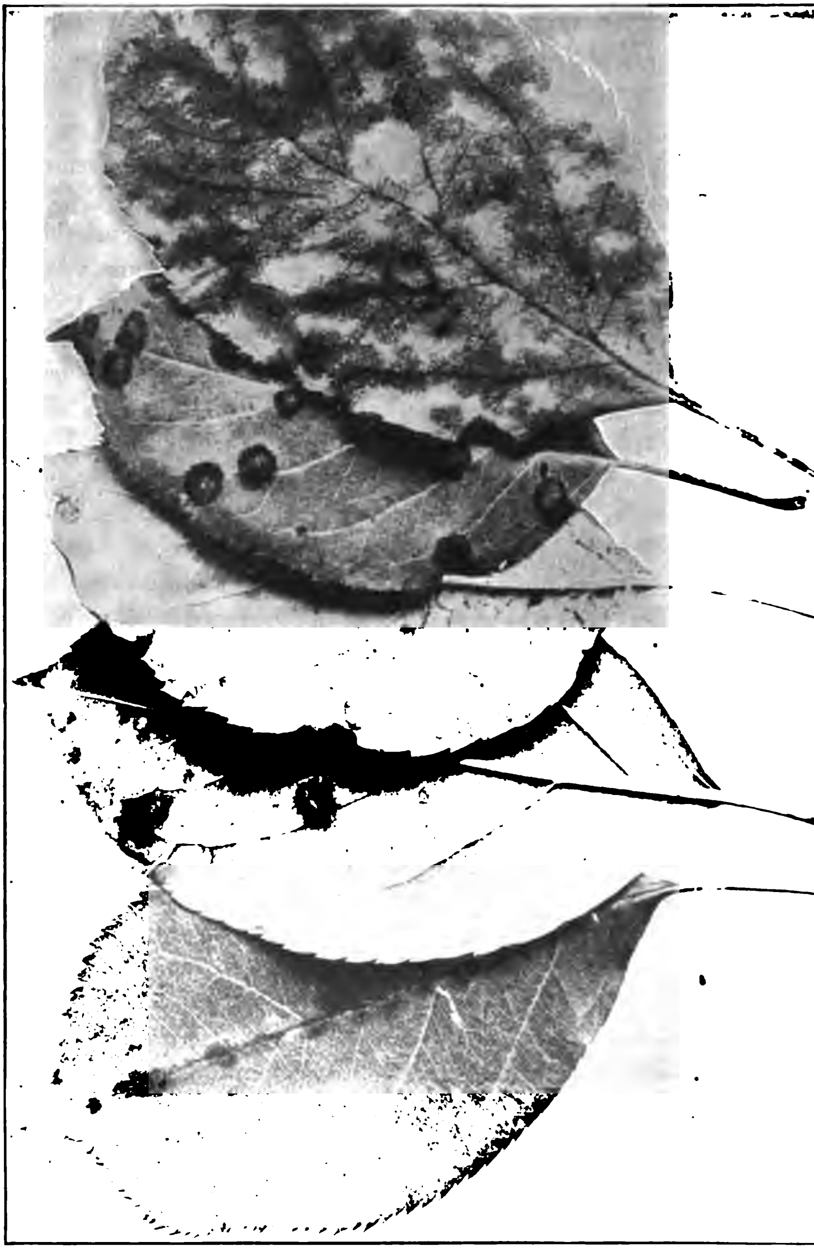


FIG. 517. APPLE-SCAB DISEASE ON LEAVES. THE SECOND AND THIRD LEAVES FROM THE LEFT SHOW THE LESIONS ON THE UNDER SURFACE

PROFESSOR BARRUS: Infection shows up just as soon as the leaves have unfolded, which leads us to believe that it must take place just as the buds are bursting, and if that is true the spore would have to be there on the bud; we should not expect it to be disseminated in the air at that time of the year. Of course we do not know that absolutely, now.

QUESTION: How much lime-sulphur do you recommend?

PROFESSOR BARRUS: We have shown that as weak a solution as 1-15 will control curl.

Now in regard to apple scab — another disease that seemed to be quite abundant last year. Some people do not understand why it is they did not control it more successfully. I think if we could understand more about the organism which produces apple scab, we should be able to apply sprays more intelligently to our orchards.

This story has been told you many times. I shall repeat it to open a discussion. You all know that the apple scab is a fungous organism; that is, one of the lower plants, and that it produces reproductive bodies in the form of spores, which float in the air. In the case of the apple scab we say there are two stages in its life history, the winter and the summer stage.

In the winter stage the fungus lives on the dead leaves that have fallen to the ground — the dead leaves which were scabby the previous season.

The fungus forms little bodies in these dead leaves on the ground which are like very tiny, black pimples. Inside of those little black pimples are formed what we call the winter spores — although they are not really formed until spring. A great many spores are produced inside of a single pimple, and a great many of these pimples are formed on a single leaf. In the spring, usually about the time the buds are swelling, these spores are ripe. About the time the buds open, if there has been a rain so as to wet the leaves on the ground, they pop out of the pimple and float in the air.

Wallace estimated that from under a single apple tree, following a year when scab was abundant, there would be several billion spores sent up into the air in less than an hour. That is a large number. If the spores were placed end to end I do not know how many times they would go around the world, or anything like that. No doubt many of those spores fall to the ground and do no harm anywhere. If there is a rainy spell, you can imagine that a large number of those spores do get on the trees. They are not shot very far — only about a quarter of an inch; but the warm air currents carry them up into the air and they are blown into the trees. Of course they reach the lower limbs first, and, if the wind is strong enough, they will be carried into the upper limbs. The under side of the leaf is most exposed during the unfolding of the bud and so is the side most likely to be infected. If the weather conditions are favorable, spores will germinate within twenty-four hours and enter the leaf. After fifteen days the infection shows up as a scab spot on the leaf and new spores are produced. These are the summer spores, and will produce infection as well as the others.

It is known that the principal place in which the apple scab fungus passes the winter is in the old leaves. The first infections which reach the apple trees take place through the spores which come from these old leaves. If that is true, one would naturally expect that if we could only destroy the old leaves we would prevent the early infection from taking place. We could largely prevent that infection from taking place in this way, and our orchard would then be freer from scab than if the leaves were not destroyed in some way. But it is very difficult to destroy them all. Plowing the orchard will turn under many leaves and thus reduce the number of spores shot out from them. There are always some, however, that do not get turned under and with favorable conditions of moisture these few will serve as a source of the first infection. The method of destroying the old leaves by plowing the orchard cannot, therefore, be depended upon absolutely to control scab. It can be used to advantage in connection with spraying.

The reason for applying a fungicide to the trees to prevent scab is to kill the spores before they can germinate and enter the leaf, that is, before infection takes place. The object of an early summer application is to prevent an early infection taking place from spores coming from the old leaves on the ground. If this early infection can be prevented the danger from subsequent infections will be reduced. To prevent this early infection it is necessary to make the application of a fungicide before the blossoms open but after they show pink.

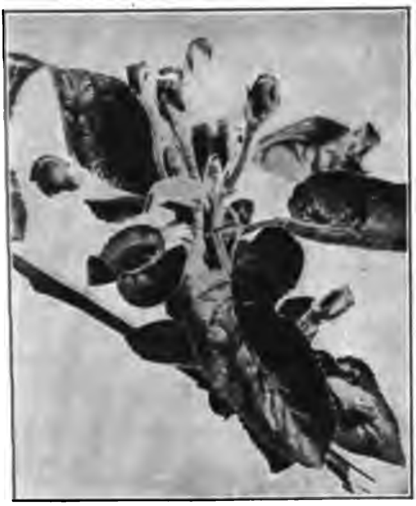


FIG. 548.— JUST RIGHT FOR THE APPLICATION OF THE SPRAY MIXTURE BEFORE BLOSSOMS OPEN.

The second application should come at the same time as that for codling moth, and should serve to prevent infection to the recently developed leaves and fruit.

The third application should come about two or three weeks later, depending upon the weather. Entomologists are recommending an application about three weeks after the petals fall.

Those three applications are generally recommended for apple scab. It may not be necessary to make them all. One spraying has controlled apple scab, but it is no guarantee that you will not have it. If weather conditions are favorable for scab in late summer it may develop then, especially if it has been abundant earlier. An application of a fungicide in the latter part of July will do much to hold such a late infection in check.

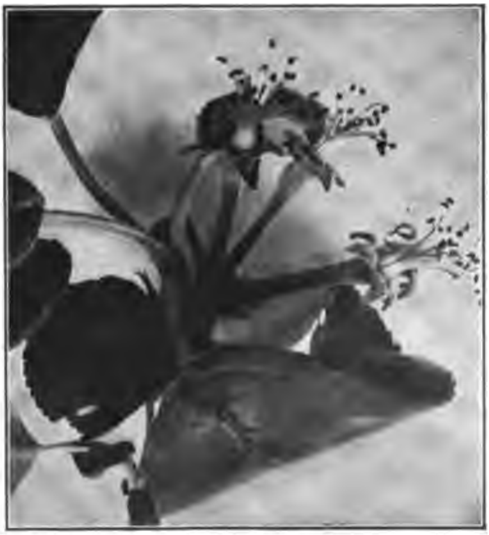


FIG. 549.— PETALS HAVE FALLEN. THE MOST IMPORTANT TIME TO SPRAY FOR SCAB.

QUESTION: Would dormant spraying do any good?

PROFESSOR BARRUS: No sir; not for apple scab.

QUESTION: Do you make a dormant spray late enough so you can catch the apple scab the first time?

PROFESSOR BARRUS: No, not as a usual thing.

QUESTION: Wouldn't the spores develop on the branches?

PROFESSOR BARRUS: No; only in exceptional cases. There are a few varieties where they occur on the branches. They do occur in the case of pear scab, but not usually in apple scab.

EIGHTH SESSION

WEDNESDAY, MARCH 17, 1:30 P. M.

ROUND TABLE

MR. VAN WAGENEN: For the next half hour we will have the Round Table, or open discussion.

I have two questions here which I will simply turn over to Professor Parrott.

PROFESSOR PARROTT: These two questions deal with spraying. The first is, What can be done to stop the injury of the quince curculio?

The curculio which attacks this particular fruit was very injurious this past year. Unfortunately, it is not a pest that can be held by the same measures, with satisfactory results, as are used with the plum curculio. It cannot be destroyed entirely by the use of arsenical sprays. The first thing is cultivation of the quince orchards, and then the jarring of the trees and destroying of the beetles as they fall to the ground; then thinning of the quinces, taking off fruit most affected and destroying the fruit when the grubs are still in them. Then, of course, it would pay to follow the ordinary schedule that is followed in a pear orchard to fight the common insects.

The second question is, Can the commercial hydrated lime be used in making lime-sulphur; if so, to any advantage?

There is no advantage in doing so, and as a matter of fact, I think there is a possibility of a great disadvantage; that is, the presence of air-slaked lime in the material. I would advise you to get the quicklime, purchasing that which tests high in calcium.

QUESTION: What about whale-oil soap and crude carbolic acid to kill aphis?

PROFESSOR PARROTT: The proper name for this spray, by the way, is "crude carbolic acid emulsion." It is not a new spray; it has been known for a great many years, and was originally introduced about 1880, by Professor Cook of the Michigan Agricultural College, to destroy the root maggot. As to its merits, I believe that, taking it for itself, it will prove an admirable spray for plant lice. I would class it with those other sprays used in spraying for aphides, and would say that you will get satisfactory results with any of those mixtures. Unfortunately, crude carbolic acid cannot be combined with any of our common orchard insecticides, such as lime-sulphur solution; so you will need to use it separately in spraying for lice, unless you are using certain oil emulsions. I would say that it is somewhat cheaper. Here are some figures that will be of interest to you, based on applying these different preparations to twelve old trees. By using the formula of 15 pounds soap, at 5 cents a pound, and one pint of crude carbolic acid at the rate of 50 cents a gallon, the cost of application will be about $1.51 for the twelve trees. If you apply Black-leaf-40 and soap, at the usual application, it would cost you $1.85, as against $1.51 with the crude carbolic acid emulsion. But the advantage with nicotine, of course, is that you can combine it with lime-sulphur and thus save the cost of labor of a second treatment.

VOICE: I know of some that tried the nicotine this year, and they said they tried to be thorough about it, but they were not sure that they obtained any results.

PROFESSOR PARROTT: Yes; that will be true under almost any circumstances, especially if the leaves are actually curled, in the case of lice. But if you apply either the crude carbolic acid emulsion, or nicotine and soap, or kerosene emulsion, at the proper time, I think you will find they will not differ.

QUESTION: Is this crude carbolic acid and whale-oil soap effectual for red bug?

PROFESSOR PARROTT: We have never made a test for it. I am of the opinion that nicotine has one peculiar merit not possessed by most of our more common insecticides; namely, its ability to kill after application.

MR. BOGUE: If arsenate of lead, by mixing with lime and sulphur, will harden on the tree, why not use plain arsenic and lime, which will remain on the tree for three months and always be pliable and soft for the worms to work on?

PROFESSOR PARROTT: Well, I imagine that is a thing to be worked out; I could not tell. The one objection to using white arsenic is that a goodly percentage of it may be soluble in water, and if the arsenic is applied by itself you will have burned foliage. The object in adding lime to white arsenic is to neutralize the free arsenic. But it is a preparation which has gone out of use, because arsenate of lead is better than it; I mean so far as killing the worms is concerned. I cannot see why it could not be added, except that you would get more free arsenic.

MR. BOGUE: When you put the arsenate of lead on a tree it hardens after three or four days. The question is, When worms work on that tree are they going to work in the hard or the soft application? Last year we had a great many worms on our apples. I applied the arsenic and lime last September, and it is on there today, where it can be seen. I examined it a great many times and found it soft.

PROFESSOR PARROTT: You cannot see the combination with the lime-sulphur. There is a reason why we use the lead arsenate. The great reason is that it is the safest to use with lime-sulphur. Then it possesses adhesiveness. A man could get this combination and get fair results, I imagine.

MR. BOGUE: Couldn't that be put on afterwards and still get the results?

PROFESSOR PARROTT: There is the question again of making the extra application. The practical experience with arsenate of lead in most orchards is satisfactory.

MR. VAN WAGENEN: Does carbolic acid have an unfavorable effect on vegetable life?

PROFESSOR PARROTT: There is no question about that. But I do not think that people in this community are going to rush to new and untried sprays at the expense of precaution. Carbolic acid is a very toxic substance, both to insects and plant life, and if you use it on foliage you must be careful to get a perfect emulsion and not drench the trees too much. We are now working on a formula with Mr. Lasher, in order to find out how greatly we can reduce the amount of carbolic acid in the preparation and still have an efficient spray.

PROFESSOR HEDRICK: I have another question here: If color is to make an "A" grade apple, will it pay to prune very heavily and drift back to sod culture?

I do not believe pruning would help out. The greater the foliage the less color; and, since pruning is always a stimulating process, you would have a greater growth of tree. I do not believe you will be able to regulate the color of apples by pruning. You can get better-colored apples in sod than though you cultivate the orchard; but, as you know, you reduce the size and amount if you keep the orchard in sod. Therefore, unless you receive a higher price for the sod apples than for the others, it is more profitable to cultivate your orchard than to keep it in sod.

This leads me to say that here in the East, especially, we are making a mistake on this color question. Of course a well-colored apple looks better, but it does not taste any better, ordinarily. Take an apple from a sod orchard, and another one from a tilled orchard not so well colored, and the chances are that you will find the less highly colored apple crisper, juicier and rather better flavored than the highly colored apple.

Our station has, for several years, tested them for keeping qualities. The highly colored apples did not keep as well as those not so highly colored. The cultivated apples not so well colored keep better, in common storage, than the sod apple. We grow apples to eat, and why should we make such a fuss over the color? I admit that we want a variety that has a color, but the Westerners have been advertising their apples because of the color, and have made people think that color was quite equal to flavor. "A big red apple " is the Westerners' cry, and they advertise their wares well by making that cry, but here in the East we ought to say more about quality and less about the color. So I think that the packing law is at fault, as well as fruit-growers all over the state, in making so much of color. I do not think it adds to fruit materially, and it should not. We grow apples to eat. A Rhode Island Greening without the red tastes just as good as a red one. Do not misunderstand me. A Baldwin apple that is perfectly green is not normal — it is off type, and I do not want that sort of apple. But I cannot see but that a Baldwin apple with a fair degree of redness is just as desirable as a bright red Baldwin grown on sod. Let the Westerners talk color and let us talk quality.

QUESTION; Is a poorly colored Spy badly flavored?

PROFESSOR HEDRICK: There is something wrong in the tree. That is not uncommon at all. That apple is not fit to eat.

QUESTION: Would that be obviated in trimming?

PROFESSOR HEDRICK: I have seen that in all sorts of trees. But between a Spy grown on cultivated land, that is large and well formed, and a highly colored sod Spy, there is no difference in the apple. These little Spies that you get in the middle of the tree are "off."

QUESTION: Professor Parrott, can you tell us about dipping cabbage plants to kill aphis?

PROFESSOR PARROTT: That is a common practice in areas especially devoted to the growing of cauliflower; the method is very commonly followed about Riverhead, Long Island. The theory underlying the practice is that the cabbage aphis often makes its appearance in the seed bed along in May, as the cabbages are being transplanted, consequently you naturally transfer the insect from the seed bed to the field. The object in immersing is to get rid of the insects and not take them to the field. The formula is one ounce of Ivory soap to one gallon of water. Ivory soap is less injurious. Immerse a handful of seedlings, taking pains to keep the roots out of the solution.

I do not think there is much danger of injury to the cabbage by the soap. We carried on an experiment at the Geneva Station with nursery trees, using different preparations. It is interesting to note that wherever we used the sulphide we killed the trees, whereas with the soap we did not kill. There is no need of immersing the cabbage roots in the liquid, so why run the possibility of danger?

QUESTION: Is whale-oil soap good?

PROFESSOR PARROTT: That may be good. I cannot give the analysis of commercial soaps. We made that a subject of study three years ago, and I think the percentage of water in the soap ranged anywhere from 8 to 60 per cent. You remember I gave you those figures.

QUESTION: Is it advisable to treat cabbage seed before sowing?

PROFESSOR STEWART: It is a very common practice in the region around Shortsville. The result is that the spores of black rot of cabbages are not transferred to the field by the disinfested seed. One ounce of the powdered material in one gallon of water makes a good solution.

QUESTION: How can cabbage plants be protected from maggot in the seed bed?

PROFESSOR PARROTT: I think the best method of protecting cabbages, in the seed bed, if you are very much troubled by the root maggots, is the employment of cheesecloth screens. Sow your seed in rows, using a garden drill; set up a frame immediately and cover it with the screen. Full directions are given in a number of bulletins of the experiment station. Babcock Brothers, of Phelps, grow a great many cabbage seedlings for their own sauerkraut factory, setting out something over one hundred acres, and in 1912 they sowed sixty-two pounds of cabbage seed. There is theoretically 36,000 plants to a pound of cabbage seed, so you will get an idea of the number of plants they endeavored to raise. They put twelve pounds under screening and the rest of the seed was in open beds. I went out there June 22, when they were pulling their seedlings, and they were not able to get enough seedlings out of an open bed to plant an acre, while the seedlings under frames were running 30,000 plants to a pound of seed.

I should advise you to try that method if you are very much troubled with maggots. If you will go around to the Geneva Station you will find a great many seed beds protected in that manner.

MR. VAN WAGENEN: I have one question here which I think belongs to Professor Parrott: Please give the amount of lime and sulphur you use for early spraying, where there is a little scale; and if any poison, how much? Also the amount you use for later spraying after blossoms have dropped.

PROFESSOR PARROTT: We use, ordinarily, for the control of the San José scale, one gallon of the lime-sulphur solution to eight gallons of water, for dormant spraying; that is, based on the commercial mixture. At the Geneva Station we always use our own solution, using one gallon to five gallons of water. It is the same as 1-8 of the commercial mixture.

QUESTION: What does your home-made mixture test?

PROFESSOR PARROTT: About 25 degrees.

QUESTION: If they are testing 28 to 29, what do you use?

PROFESSOR PARROTT: One to six or 1-7 there.

QUESTION: What proportion of lime and sulphur to make 28 or 29?

PROFESSOR PARROTT: Use about 80-40-50 to get a 25-degree mixture. I would not work anything above that.

QUESTION: Would you put that same 1-8 on for peach leaf curl?

PROFESSOR PARROTT: If you have scale I certainly would, because you get a mixture that will control both pests.

QUESTION: Would you put arsenate of lead in that spray?

PROFESSOR PARROTT: No, I would not, if the buds are dormant; but if you are delaying until you see the pink of the blossoms, then put in the arsenate of lead for apple trees. Now, then, for summer spraying here, a common dilution is one gallon of the lime-sulphur to forty gallons of water, and to every fifty gallons of the diluted spray add three pounds of arsenate of lead. Those are the common proportions for apple orchards.

QUESTION: In making your lime-sulphur, what do you use?

PROFESSOR PARROTT: For most of our work now we are using 80 pounds of sulphur, 40 pounds of lime and 50 gallons of water, although this year we are working with a new spray which is easier than the other. The good feature about the Geneva formula is, I think, that you get a more economical use of your material. You can make it by both formulas.

INSECTS LIKELY TO DEMAND THE FRUIT GROWER'S ATTENTION THE COMING YEAR

P. J. PARROTT
Entomologist, New York Agricultural Experiment Station, Geneva

I wish to discuss those questions relating to spraying for particular insects, on the basis of your experience. I had in mind saying something along the line of controlling the San José scale — the mixtures, how to spray and the work of the parasites; also something about the pear psylla, the aphis, and the insects that are responsible for deformed apples. I have not come here with any pre-arranged talk on any of those points I have suggested, and if you will kindly indicate what questions you would like to hear discussed I shall be glad to do my best. It is your meeting.

QUESTION: Can you tell us something about the red bug?

PROFESSOR PARROTT: We will start with a discussion of the red bug, which is one of the new pests that has come to the front in recent years, and which I am very much afraid is going to effect a profound revolution in our spraying methods if it continues to be as injurious as it has been during the past two or three years

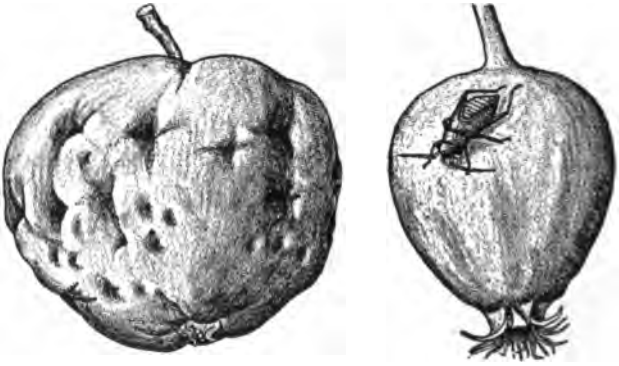


FIG. 550. A RED BUG AND ITS WORK ON APPLES

I have here an illustration of a mild form of injury by the red bug. It is mild because it does not represent, by any means, the seriousness of the injury by this insect to apples. But it illustrates, in general, that pitted effect of the fruit as a result of the puncturing of the young apple by the insect.

I think, before one can really spray intelligently against an insect of this character, he ought to have in mind some of the activities of the insect; he ought to have clearly in mind a knowledge of the life history of the pest. So if you will permit me, I shall briefly review the life history of the red bug, and then we shall discuss the treatment for it.

At this time of the year the red bug is in the egg stage, and that egg is in the young wood. Soon after the buds begin to break, the young red bug (if it belongs to the false red bug species) makes its appearance and begins to attack the new leaves. You can detect its presence in an orchard by closely examining the terminal leaves; if you notice a reddish effect upon the leaves, as if the foliage had been sprinkled with cayenne pepper, you may be certain it is present somewhere on that twig or branch. If you look closely, you can usually find it on the under side of the leaf or resting in a curled leaf. I have been able to detect it by taking some of the wood of the tree into the kitchen, keeping the branch in water and watching the buds as they unfold. Then the little red bug is a very conspicuous creature, having much the shape of an aphis, but very much more active. Usually you will not find a great many of those creatures to a branch, but as they are so active they are able, as individuals, to cause a great deal of damage, going from one fruit cluster to another, oftentimes injuring a large percentage of the fruit on a branch or a limb.

When the blossoms open and the young fruit sets the little bugs pass from the leaves to the fruit and insert their proboscides into the fruit, as a result of which the young apple is stunted and oftentimes will drop. If not stunted enough to drop it may cease to grow, or may grow slowly, making the fruit undersized and showing the characteristic pitting.

There are two species present on an apple tree — the false red bug and the true red bug. The true bug hatches a little later than the false. Both species, fortunately, can be controlled by the same spray, namely, a tobacco mixture; and, if the insects are numerous, by using this with lime-sulphur and lead. If you have the red bug in your plantings, I should certainly advise you to examine the trees carefully this year to find out if they are located on certain trees in a certain portion of the orchard; and, if so, I should give those trees a thorough drenching with nicotine just before blossoming. If the bugs are numerous another application after blossoming would be advisable. It is a case where you have got to make the combination, using the nicotine at the rate of one pint to 100 gallons of dilute lime-sulphur and arsenate of lead. Of course you may not know on what trees the eggs are deposited, and you may get wood on which they have not been deposited. In the orchard of Hon. T. B. Wilson, at Hall, this insect has been established on practically all the trees. On the other hand, in the Maxwell orchard at Geneva, it is localized, attacking eight or nine trees in an orchard, and not spreading greatly. And yet the insect, strange to say, is something like a squash bug when it matures — it takes on wings and can fly.

QUESTION: Could the eggs be seen at this time of the year?

PROFESSOR PARROTT: No; they are very hard to find. They are buried in the succulent bark of last year's growth. If you are curious to see the creature, take some wood from the trees that are affected and see if you can breed them out. If you wait until the leaves make their appearance and examine the terminal leaves you cannot miss them if you keep in mind the description I have given of them.

QUESTION: Will they attack one variety of apple more than another?

PROFESSOR PARROTT: Yes; I should say there is a tendency to attack the more tender varieties. In some orchards Greenings suffer severely from them, although they go to other varieties, like the McIntosh and Twenty Ounce.

QUESTION: How much arsenate of lead should be used to 100 gallons of water?

PROFESSOR PARROTT: I should use the ordinary summer strength of lime-sulphur and arsenate of lead; that is, 6 pounds of lead and 1 pint of nicotine solution to 100 gallons of dilute lime-sulphur.

We will now take up the question of the control of the rosy aphis, an insect which, during the past ten years, has certainly come to the front in New York, and now ranks as one of the worst pests of the apple. It is also interesting to note that in the apple-growing sections of the West this same species has appeared, although in some areas it is not so destructive as the green aphis, especially in the irrigated sections.

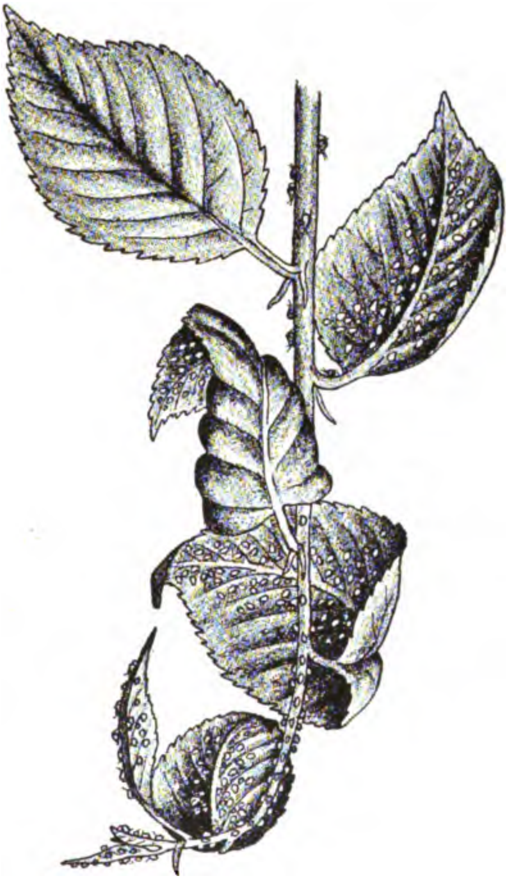


FIG. 551. APHIDES ON APPLE LEAF.

Destroying these insects is not so much the question of choice of mixture as a matter of method. We need to change our methods in combating plant lice; we should not wait until the fruit has been badly injured.

I have here a chart illustrating the life history of the aphis, with reference to the unfolding of the foliage and the blossom period, which period is co-incidental with the destructive stage of the rosy aphis. By examining this chart you will see that it is drawn off in sections marked by vertical red lines, and each headed by the month of the year in proper succession. Below are illustrations of the apple aphis in various stages of development with reference to the year. At this time of the year the apple aphides are in a dormant stage, and if you go out in an apple orchard or into a nursery block or along the roadside, and gather some of the fruit spurs, I am sure you will have no trouble in finding little blackish bodies in folds of the bark. These are the eggs of one of the common plant lice which attack apples; they are all so very much alike that it is difficult to tell one from another.

During the latter part of April, as the buds are breaking and show green to the ends, there is a simultaneous hatching of eggs on the apple wood, and a migration of the young lice to the ends of the buds. We get this characteristic sight some time in April — all species of plant lice piling in great numbers on the most advanced buds. Then, as the leaves unfold, the lice pass into the interior of the bud, and then work to the under surface of the leaves and establish themselves on the inside of the lower leaves of the new growth.

The first lice are at the basis of the growth in the first leaves, which are usually very small and tightly curled. Then as they mature they give birth to young lice, and up to the middle of June there are probably three broods of young lice. In that period the greatest injury is done to the apples — the dwarfing and stunting — because of the drain on the sap-content of the young fruit. The lice, during the latter part of June and July, take on wings and fly to one of their summer hosts, which are the narrow and broadleaf plantains. There they go through several forms, and then again in the fall return to the apple foliage, where true sexes appear and they pass down to the bark to deposit eggs.

I think the chief cause of failure in combating plant lice is the fact that there is a tendency to spray too late — when the leaves are badly curled, and at a time when they do not respond to treatment, being so severely injured and the fruit stunted. Our experimental work (which, by the way, is now being duplicated by other institutions) points to the condition of the buds in that state of development as the most satisfactory period for the treatment of plant lice to protect the apple trees from the aphis. We are advising this treatment: if, at budding time, you are spraying with lime-sulphur, you may add nicotine to the lime-sulphur solution, spraying thoroughly, with the object of wetting the ends of every bud, in order to destroy 90 to 95 per cent of the lice. Work along this line was done this past summer and gave very satisfactory results, whereas treatment made later was almost a failure. If you spray with the lime-sulphur to combat the San José scale you do not kill the lice, and the only thing to do is to make a special treatment with Lasher's Carbolic Emulsion, or soap or nicotine and soap.

VOICE: My question was whether the two could be combated at the same time.

PROFESSOR PARROTT: It is not advisable to combine the emulsion with lime-sulphur. Lime sulphur will not stop the severe injury by aphides.

QUESTION: Would you use 1-8?

PROFESSOR PARROTT: If you have San José scale spray with lime-sulphur, 1 to 8.

QUESTION: Will the lime-sulphur destroy the eggs before they hatch?

PROFESSOR PARROTT: One of the strange features of our work is that here in the East we do not get the same results on the aphis eggs that they do in California and the western states. Just recently my attention was called to bulletins issued by government workers in California, where one had been working with the walnut aphis, and another one with the apple aphis. They all report that by applying lime-sulphur solution of dormant strength they can kill from 80 to 90 per cent of the aphis eggs. We cannot do it here in the East. I do not understand it; I cannot explain it. If you have had the opportunity to watch the apple orchards in New York as we have had, with reference to the use of lime-sulphur for scale, you will have noticed that a great many of those orchards that have been thoroughly sprayed have sustained great losses from the apple aphis. That has been our experience for the last ten years. If you want to conduct an experiment in spraying for plant lice, select say fifty trees, and, starting this year, make a regular practice for that block of trees.

MR. BOGUE: In spraying with lime-sulphur for scale, if a little spot where the scale is should be overlooked, when the insects hatch will they crawl out of there or will they be killed?

PROFESSOR PARROTT: I am glad you brought up that question because I want to explain it. I have here a chart of the San José scale. I understood, before coming up to this meeting, that some of the growers in this community are now getting alarmed over the appearance of the San José scale in their apple orchards, and some of them have to thoroughly spray large apple trees to control this pest. Mr. Bogue has raised, at this time, the great fundamental difficulty in combating the San José scale. This large drawing represents the San José scale; that is, the protective covering over the insect. It is really a vertical section through the San José scale. This yellow body represents the insect itself. The individual San José scale is not much larger than the head of a pin, and when you have wood as badly infested as that is, you can realize there are hundreds, and perhaps thousands, of those insects on the bark. Not only that, but they have a way of massing over one another, so you get the effect of two or three layers of scale on the wood. In order to control San José scale effectively, every one of those insects should be killed; and that requires very thorough spraying — thorough wetting of the wood —so that there is not a space as large as a pin-head that escapes the treatment. The unfortunate thing about our spraying is that we have to spray during the dormant season, and cannot spray in the summer season. The reason is that the strength of lime-sulphur solution we can use on foliage is not sufficiently strong to kill the San José scale.

Another thing, during the summer-time we have this other factor to contend with: the insect moults under this scale, and, in moulting, throws up its own skin into the apex of the scale; it moults twice in its life history, so it has two coatings besides the scale over it. The mature scales are much harder to control than the winter scale, which is a larva scale. By looking at this specimen you will find that they are very small creatures, and they do

not have these moulted skins. Scale at this time is more easily controlled than in the summer-time. Fortunately we can use lime-sulphur solution much stronger now than we can when the leaves are on the trees.

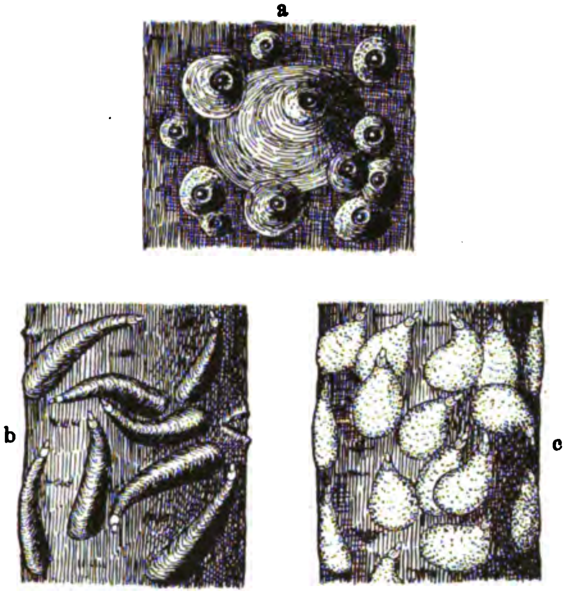


FIG. 552. COMMON SCALE INSECTS (much enlarged), (a) SAN JOSE SCALE, (b) OYSTER-SHELL SCALE, (c) SCURVY SCALE.

If you have San José scale in your large apple orchards I should advise you, if the trees are badly incrusted with the scale, to make your lime-sulphur solution about 1 gallon to 7 gallons of water; or, if the trees are moderately incrusted, to use 1 gallon to 8 gallons of water. In the case of old apple trees, spray with the wind, and spray from all sides, using the solution liberally and applying at least 13 or 14 gallons to a large tree. It will require that amount to thoroughly coat all the wood.

I think a good practice is the thinning out of the trees where they are old and closely planted, and the upper branches are interlacing. It is also good practice in some orchards to take out alternate trees, or alternate rows. In the end the owner will be a gainer by the improved quality of his fruit, freedom from scale spots and scab, and the greater economy in spraying. In these old, closely-planted apple orchards it is certainly a difficult problem to spray thoroughly, because of the interference of the large branches with the operators.

QUESTION: Why is it that the San José scale is so much more prevalent in Orleans and Niagara counties today than it was a year ago?

PROFESSOR PARROTT: The increase of the pest, so frequently complained of, is more apparent than real. People are seeing more of it now than they used to. In the last ten years, of course, there has been a greater planting of trees; and, in such planting, infested trees have been brought into the county. Each one of those orchards where infested trees have grown has become a centre of infestation, and gradually it is radiated. It is getting to be a serious problem for the owners of such orchards, when it comes to raising fruit largely free from spotting, if they are going to follow the law with respect to the imperfections of fruit.

QUESTION: How can I advise my neighbor to either spray his infested trees or cut them down?

PROFESSOR PARROTT: That I cannot answer, because in the last eight or ten years when that question has been brought up it has never been satisfactorily handled by those who are supposed to be charged with the enforcement of the agricultural law with respect to that very problem. It seems to me that the law itself is explicit enough, and that an owner who is threatened by his neighbor's planting ought to get assistance from the agricultural department.

VOICE: My neighbor has a dozen old trees badly infested with scale.

PROFESSOR PARROTT: The only thing I can suggest (and it is a thing we have recommended in one or two communities and they have secured some help) is that the fruit-growers, collectively, write a very urgent letter to the Commissioner of Agriculture, and I am inclined to believe that when that is done you will get relief in proportion to the kick that you make. I say this because in certain communities where nursery stock is concerned, and the nursery-growers have raised a howl, they have obtained much more protection than nurserymen in other communities who take things as they are and have suffered from it.

QUESTION: Will regular spraying control oyster shell scale?

PROFESSOR PARROTT: Yes; it will gradually disappear from those trees that are successfully sprayed with lime-sulphur. I should not make a special application for oyster shell scale.

QUESTION: Would you advise spraying for scale in the fall?

PROFESSOR PARROTT: After the breeding season, which discontinues after a severe frost. Up to the time of early frost the insects are present on the tree, and the mature insects are not so susceptible to the lime-sulphur solution as those immature. After the fall the old ones die off, and that leaves the immature insects on the trees to go through the winter. Consequently, wait until the breeding season is over.

QUESTION: What is the process in destroying the San José scale? Is it excluding the air?

PROFESSOR PARROTT: I am glad you asked that question. It just shows you how little we know. We do not know what kills the San José scale, but we think, of course, that the killing property is proportionate to the amount of sulphur in solution. How this kills scale we do not know. I am inclined to believe it is killed in a number of ways. When we apply lime-sulphur we endeavor to thoroughly coat all of that scale; and, where a good, old-fashioned lime-sulphur solution is used, you have such a coating that you cannot find the scale. Under those circumstances, I am inclined to think that the insect dies from suffocation for want of oxygen. That probably accounts for the killing of a lot of scales. But here is a queer thing: I have one man working on this very problem, and he finds that by just putting a little lime-sulphur solution on the scale with a tooth-pick, the solution does not go through the scale or get through the skins, and yet that insect succumbs. It certainly cannot be for want of oxygen, on account of the open area. So it is apparent that there is some poisonous gas given off which simply overwhelms the insect and destroys it. Chemists have tried to detect what gas it is, but they cannot find anything that will account for the killing of the scale.

QUESTION: How soon after the application does the scale die?

PROFESSOR PARROTT: That is hard to determine, because we do not know when a thing dies; it is a slow process. But I am inclined to believe, from the work we are doing, that the majority of the scales are fatally affected within eight days after application. What I mean to say is, that they may respond to irritation, but they are so affected by the spray that they will not recover.

VOICE: I have heard it said that they last two months.

PROFESSOR PARROTT: That is the old idea. The actual killing, for most of them, takes place soon after the application. There is a certain amount of killing by the sediment sealing the insect down so that the offspring cannot get out, but not a high percentage of the scales are killed in this manner.

VOICE: A young man from Cornell told me last fall that he had been instructed that the lime-sulphur excludes the air and smothers the insects.

PROFESSOR PARROTT: Yes, that is what we believe. We may not believe it the next time we have an institute, but that is what we think at present.

QUESTION: In spraying, what pressure would you advise?

PROFESSOR PARROTT: You know my ideas on that. I believe in having a high pressure — somewhere in the neighborhood of 150 or 175 pounds, or more. I think pumps with a large capacity are what we need.

QUESTION: Do you carry as high as 225 pounds pressure?

PROFESSOR PARROTT: We carry about 200 on an average.

QUESTION: At what time is the scale in condition to kill?

PROFESSOR PARROTT: In other words, you mean the stage when it is most susceptible to treatment. Right now,— during April.

VOICE: I thought it was soon after they hatch.

PROFESSOR PARROTT: That is true, but you cannot use lime-sulphur then. That is the trouble.

QUESTION: If, in using any spray during the summer, the scale should be hit with a weak summer spray, would it be killed?

PROFESSOR PARROTT: That is quite a big question. Just to answer your point: If you wait until June 20 (the average date for the appearance of young scales in this community), what do you have? You then have those scales that went through the winter in the mature stage, and these scales are resistant to our solution. Their offspring are commencing to appear at the rate of ten a day for forty days. You do not get the mature insects;

you kill only the larvæ that appear when you make the application. That is the trouble with that method.

QUESTION: Would it not be apt to kill the old scale?

PROFESSOR PARROTT: We are working with a spray that we hope will accomplish something along that line, but weak lime-sulphur does not kill old scales.

MR. VAN WAGENEN: If anything were unnecessary it would be to introduce Professor Hedrick to an Orleans county audience. He will now address you.

THINGS TO BE EMPHASIZED IN PRESENT DAY HORTICULTURE

PROFESSOR U. P. HEDRICK

Horticulturist, New York Agricultural Experiment Station, Geneva

FERTILIZERS

As you all know, we have been carrying on experiments with fertilizers for some years on our grounds at the Geneva Experiment Station. Three years ago we began similar experiments in different parts of the state, and I am sure you will be interested in some of the data that we have obtained.

To recapitulate in regard to the work we have done on our own grounds: We began twelve years ago and put on potash and lime, and secured no money returns from the application of these to the old orchards. We did get returns from manure and cover crops. Then nineteen years ago we began with a young orchard under special conditions, in which we tried to safeguard against every possible source of variation. Fifteen years ago we published the results, in which we showed that we got nothing from the potash, phosphoric acid, lime, or nitrogen. Both of these orchards were given thorough cultivation and annually had cover crops plowed under. Under other conditions I am sure we should not have had these results.

Now we have had four more years with this young orchard. Nineteen seasons have passed by since we began with this orchard of Rome Beauties, adding the several elements we were told should commonly be applied. I shall read the results we had last year. I am not going to tell you about the plats; they are discussed in a bulletin published by the station, and most of you have heard them discussed elsewhere. I want to give you the results of the past four years from this young orchard. The average yields per tree for the four years just past, with the different fertilizers, are as follows: stable manure, 428 pounds; phosphoric acid, 359 pounds; phosphoric acid and potash, 424 pounds; phosphoric acid, potash and nitrogen, 450 pounds; check, 402 pounds. The figures are so near that they are all within the range of variation, and you will see that we have obtained nothing from the nineteen years of application of fertilizers in this young orchard. The nitrogen has passed away and the money has been thrown away. Inasmuch as there is enough potash in the soil, according to the chemist, to last over 900 years, and enough phosphoric acid to last 450 years, you can see that we will not be called upon to add phosphoric acid and potash to this soil for a long time.

Leaving the Geneva Experiment Station, you have an orchard here in your community, owned by Mr. Densmore, to which we have added fertilizers for three years with no appreciable results. Whether or not we will have results in the years to come we cannot say. Several other orchards in different parts of the state have given us practically the same result, namely, no gains from the use of fertilizers. Last year we ended an experiment running two years with nursery stock near Geneva. We applied all of the elements of fertility to growing nurserry trees, thinking we might get results. No success. The check plats were as good as the others.

I cannot leave this subject without qualifying and saying that, in all these experiments, the trees have had the best of care; and that our soil, while not of the best, is at least of average fertility. Possibly under adverse conditions, results might have been obtained from the use of fertilizers.

I am very sure, from observation and experience, that in all sod orchards nitrogen, at least, is a profitable fertilizer for fruit trees. But for many reasons I am inclined to think that no man ought to apply fertilizers to fruit trees without first carrying on an experiment to find out whether he is getting any returns in his orchards. Especially, he ought not to apply potash and phosphoric acid. I feel sure there is enough of these in the soil to carry the trees along. It is less doubtful with the nitrogen.

I hasten to say, also, that when I first published these results five years ago I was attacked by agricultural papers all over the country, and by some of the people in your own community. Many of them did not agree with me. I want to tell you that other experiment stations (notably those of Oregon, West Virginia and Vermont) are now having results very similar to ours.

QUESTION: Would you include peaches, in this respect?

PROFESSOR HEDRICK: I suspect the average peach orchard, being on a sandy soil, needs nitrogen, and some of them may want phosphoric acid.

Do not go on the assumption of agents, and of advertisements, that your trees must have fertilizers. Try it out first and see if you are getting results. If you do not see results in a year or two, it is quite safe to conclude that you are wasting your money.

QUESTION: What would you say about lime on sandy soil?

PROFESSOR HEDRICK: I doubt very much if you would get any results from lime, in this section. Some plants, like the legumes, need plenty of lime; others positively refuse to grow in a soil where there is lime. There are all gradations between these two extremes. Our fruits are rather nearer the plants that do not want lime than they are to those that do need lime, and I rather doubt whether lime is very essential to fruit trees. It may be essential to use lime in an orchard in order to grow clover and vetch; but where they will grow without lime it is throwing money away to buy it.

IMPROVING OLD VARIETIES

The next topic I want to take up is that of improving old varieties of fruits. Much is being written in the farm papers, and even more in the catalogues of nurseries, about improved strains of fruit. At our station, for the past ten or twenty years, we have attempted to buy every variety of fruit that we could get hold of in the United States, and a great many from Europe. In particular, we have bought all the improved strains of Baldwins, Greenings, Snows and Twenty Ounces, and have bought or have had given to us every sort of variation or strain. We have planted these improved strains side by side with the parent variety to see what there was to it, and ninety-nine times out of a hundred we have not been able to see any difference. The late Elberta ripens along with the Elberta you know. In other words, these improvements have been in name only, in most cases.

But once in a while we do get an improved variety, and it is to these, in particular, that I want to call your attention. For instance, a man in Newburgh, Mr. Cornell, sent us a russet Bartlett pear exactly like the old original Bartlett, except that it is russet; ripens at the same time, tastes the same, the tree is the same, but it is a russet. It has no value at all, because a pear with a russet skin shrivels quickly — more so than one with a smooth skin. But it is interesting to know that there is a russet Bartlett.

Another man said he had a bright red Seek-No-Further, and it turned out to be so. This is another case of these sports that is worth while. Then we have on our grounds four red sports of the good old Twenty Ounce; one is the Collamer Twenty Ounce, one the Hitchings, and another the Opalescent. I have recommended the Opalescent as a valuable new fruit, and did not suspect it was a strain of Twenty Ounce until this last season when Mr. Anderson, Farm Bureau Agent of Niagara county, sent me in a sport of a Twenty Ounce. I took it to the boys in the office and said, "Here is a new apple — what is it?" They all declared at once, "It is Opalescent." We went to the orchard and found the two fruits to be indentical. We examined bark and leaves of old and young trees, and found that Opalescent and Twenty Ounce differed only in the bright, handsome red of the Opalescent skin. You have then, in these cases, excellent variations of the old Twenty Ounce apple. I would advise any of you who want to plant Twenty Ounce to obtain one of these variations. I suspect Opalescent is the one most commonly grown by nurserymen. Any of them are more attractive in appearance than the old Twenty Ounce.

To conclude this matter of improved varieties: There are, now and then, cases in which you do have bud variations, or sports (whichever you want to call them), that may or may not be improvements on the old varieties. These nearly always have to do with the color of the fruit. We have been unable to determine any difference in improved varieties, as to time of ripening, or any character other than the color of the fruit. When the nurseryman sends you a catalogue saying that he has pedigreed trees, and that this strain or that strain or the other strain is better than the old, original variety, you want to look quite carefully at his proof. It may be true — once out of a thousand times. If some good, reliable fruit-grower has fruited the new strain and knows that it comes true, buy it; and feel sure you are getting an improvement. But if there is no such proof, the chances are that the improvement is only on paper and not a reality. Beware of pedigreed fruit trees until you have positive proof that they are what they are recommended to be.

EUROPEAN GRAPES

Leaving this matter, I want to take up for a minute or two the question of European grapes. The topic may be of interest to you from the standpoint of fruit that you want to grow in your own garden for your own consumption. You know the difference between European and American grapes. The Concord, Delaware and Niagara are our types, while the large, luscious bunches of grapes that you buy in the fruit stores are the European sort — larger and sweeter, with skins that you can eat, fewer seeds, and seeds that can be eaten if you want to. They keep longer and the vines are twice as productive; in every way the European grape is superior to our native grapes. When our forefathers came over they tried to raise these fine European grapes here in the East, and all failed. One of the old experimenters said that sickness takes hold of the vine and it dies. We did not know what this sickness was, but have learned that it is philloxera.

In the last hundred years agriculture has made many advances. Science has helped a great deal, and perhaps not more so than in viticulture. We have learned a great deal about growing grapes and controlling their insect and fungous pests. No one in this century, however, seems to have thought that it was worth while to see what we could do in growing European grapes. Through a happy circumstance we have come to believe that these fine European grapes can be grown in America. We have been doing a great deal of hybridizing at the station, and imported a hundred varieties of European grapes. This was six years ago. Knowing that philloxera would attack the grapes if they were not on the roots of native sorts, we grafted them. To our great surprise, they not only withstood the philloxera and resisted all insect and fungous pests, but they have withstood two of the coldest winters we have had in twenty-five years, and one of the hottest and driest summers. The first two years they did not bear, the third year they bore some, and the last two years they have borne splendid crops. So it now looks as though, with a little extra care and by graftng on the roots of our native sorts, we can grow European grapes in the United States.

I have mentioned European grapes because I hope, in another year or two — perhaps next fall — to have cuttings, and I should like to have them tried. I do not look for commercial plantings of European grapes for the next fifteen or twenty years, or until we have solved some problems connected with them, but I shall not be surprised if, in fifteen or twenty years from now, there are large plantations of these splendid European grapes in different parts of New York. I shall not be in the least surprised to learn that, right here in Orleans county, the European grape may be a factor. I am telling you this so as to whet your appetites for them when they come.

FRUITS RESISTANT TO INSECTS AND FUNGI

I want to call your attention to the natural resistance that many fruits have to different insects and fungi, a subject that was broached this morning but not discussed at any length. Many varieties of fruits are relatively immune to some of our worst fungous troubles. The general farmer who wants to grow fruits, and does not want to spray, ought to secure these varieties; and the fruit-grower might well try some of these relatively immune kinds. At any rate, a list of them ought to be of interest to those of you who grow fruits and who do spray. The following is a very incomplete list of such varieties.

The varieties of apples comparatively immune to apple scab are: Alexander, Ben Davis, Gravenstein, Grimes Golden, Hubbardston, Oldenburg, Red Astrachan, Tolman Sweet, Tompkins King, Wagener, Wealthy and Yellow Transparent. You will notice that this list does not include some of our best commercial kinds, as Baldwin, Greening, Northern Spy and Snow; these are relatively sussusceptible to apple scab.

Rather more important is a list of sorts that are fairly immune to apple blight, a disease that you cannot control by spraying. These tests have all been made on our grounds. Varieties relatively immune to blight: Baldwin, Delicious, Grimes Golden, Northern Spy, Tompkins King and Twenty Ounce. Some of them, especially the Twenty Ounce, are sometimes attacked by blight. None of them on our grounds are as susceptible as Greening or Rome Beauty.

The matter of resistance to curl leaf was brought up this morning. We have about four hundred and fifty varieties of peaches in the station orchard, and we have not sprayed for curl leaf in order to find out what varieties are most susceptible and what most immune to curl leaf. The peaches most resistant are: Barnard, Early Crawford, Gold Drop, Kalamazoo and Smock, while Elberta and Crosby are relatively susceptible to the curl leaf.

Quite as important is a list of the varieties not susceptible to the dreaded brown rot, which is very hard to control in peach orchards. The varieties of peaches that are freest from brown rot are: Smock, Belle of Georgia, Salway and Stevens; of plums, Bradshaw, Pond, Middleburg and Field; of sweet cherries, Napoleon, Windsor, Black Tartarian and Schmidts.

The pears most resistant to pear blight are: Garber, Kieffer, Sheldon and Worden Seckel.

I know you cannot remember all of these varieties, but just keep in mind this essential fact — that there is a difference in the susceptibility of all fruits to the different diseases to which they are subject. There is even a wide difference in the susceptibility of varieties of fruits to San José scale. By writing to our station or to Cornell you can secure definite information to guide you in selecting resistant varieties.

FRUIT STOCKS

Leaving this matter for another, I want to take up for a few minutes the matter of stocks for fruits. A fruit tree is a consort of two individuals. The part that bears the fruit that you want is grafted on a seedling root. These seedlings come from various sources. In the cases of apples and pears, the plants are brought from the Old World, the seeds of which came originally, in most cases, from cider mills. So, too, the seeds planted in the United States are all from the cider mills.

Now surely there must be variations in these seedlings. One seedling may be good, another poor, and another indifferent. Yet we pay no attention to these variations in seedlings; we have not given the question of stocks consideration. This applies to apples, peaches, plums and cherries.

During the last year I have tried to make a study of this subject, chiefly from literature but also from the orchard. From what I can glean, stocks modify the cions that are grafted on them in the following ways:

1. The stock modifies the form and stature of the plant, as in the case of dwarf apples and pears. Let me say that the vigor of the apple or pear is not affected in the least, but the top takes on the form of the stock on which it is grafted. Thus a dwarf pear is always grafted on a quince, and the pear takes on the form of the quince. If you graft the Winter Nellis pear on a Seckel, the Winter Nellis takes on, to some extent, the form of the Seckel. So, too, if the Canada Red is grafted on a Northern Spy or Ben Davis, it takes on, to some extent, the form and shape of the Northern Spy or Ben Davis.

2. A variety may be adapted to a special soil by means of the stock; a case is, when peaches are worked on plums. Here is a matter that we have not looked into in the least, and yet I am very sure, from the many plants we have on our station grounds, that much can be done to adapt different varieties and different fruits to different soils, by working them on a stock adapted to that soil.

3. Through the stock the plant may be made to endure an incompatible climate. Thus, southern apples grow in the North when worked on the proper stock. In the colder parts of Canada most of the apples are grafted on the hardy crab-apple or some Russian apple, because the stock mature their wood more quickly and the plants go through the winter in better condition.

4. The stock, if diseased, may impart the disease to the cion. Such is the case when peach stocks infected with peach yellows or little peach are budded with healthy buds.

5. The productiveness of the tree is often increased by the stock through an increase in the vigor of the plant, or paradoxically enough, as in the case of drarf apples and pears, through decreasing vigor of the plant. That is, some trees are so vigorous that they go to wood unless you check the vigor somewhat.

6. The time of maturity of both wood and crop may be

changed somewhat by the stock — hastened on the one hand or retarded on the other, according to whether the stock ripens earlier or later than the cion. We are warranted in saying that earliness is promoted in the cion whenever the stock ripens its wood earlier; lateness, when the wood ripens its wood later.

7. The color of a fruit may be changed by the stock; thus, color is heightened by earliness and lessened by lateness in the maturity of a variety, in the cases in which the stock influences the time of maturity.

8. The size of the fruit is often increased by the stock.

9. The stock often affects the flavor of the fruit, chiefly through a change in the texture, and in the juiciness of the fruit so produced.

10. Some stocks shorten the life of a tree of which they are a part. Cherries on Mahaleb stocks are much shorter-lived than on Mazzard, as are also apples and pears on dwarfing stocks.

I cannot dwell on this subject longer. In brief, I want to show you that you ought to take into consideration the stocks your fruits are being worked upon.

SIZE, QUALITY AND COLOR

I shall now discuss, for a minute or two, the matter of size, quality and color in apples. The new apple packing law in New York is making these subjects all very important.

How can we increase the size and improve the color and quality of fruits? It is easy enough to increase the size, under most conditions. Anything that gives better tree growth, as plowing under leguminous cover-crops, or, in some soils, adding fertilizers, or heavy pruning, will increase the size of the fruit; or, you may thin the fruit and thus increase the size.

It is quite a different matter to change the color of fruits. Other things being equal, fruits (especially the apple) grown in bright sunlight are best colored. It is very hard, however, to so prune trees that you can increase the color through giving more sunlight, for the reason that as soon as you begin to prune you stimulate growth and defeat the very ends you are striving for. But by planting trees far enough apart and keeping them from shading one another, and using sunny locations, you can do a little something in the way of improving the color of fruit.

The heat of the sun has about as much influence on the color of fruit as light from the sun. You immediately jump to the conclusion that the more heat from the sun — the warmer it is — the higher is the color. But, the opposite is true. The best colored fruit comes from the high altitudes, from the Pacific Northwest, where the days are bright and sunny, but where the nights are cold. And in seasons in this part of the world when days are bright and sunny and nights cold we get the best colored fruit. High color comes with maturity in fruits — comes with the ripening process.

The cold nights cause a cessation of growth — checks the growth, hastens ripening and heightens the color. In fact I am not sure but that rainy weather, if it alternates with sunlight, gives better colored fruit.

There is something in soils, no one knows what (most likely soil heat), that helps to give color to fruit. You all know localities where fruit is highly colored and a few miles away fruit is not at all well-colored. We have such a situation at Geneva. Our heavy soils produce fruit that is not well colored. A few miles away, near Phelps, where there is more lime and gravel, the fruit is beautifully colored — as well colored as from the Pacific Northwest. The soil at Phelps is much warmer. The physical and chemical constituency is somewhat different, but just in what respects I cannot say. In all of the fertilizer experiments we have carried on at Geneva, we have not been able to see any difference in the color of the fruit, except that the addition of nitrogen brings about large growth in sod orchards, and has always given greener fruits. The withholding of nitrogen may be a method of giving more highly-colored fruits. Sod, as you know, gives higher color, but at the expense of size of fruit and the quantity of fruit; so markedly at the expense of these two essential characters that there are very few places in which it is advisable to try to grow apples in sod. Men in different parts of the country have tried different kinds of chemicals to induce color, but with no results whatever.

" Paul plants and Apollos waters," but God gives quality and we cannot change it very much. We have good quality here in the East, whereas in other parts of the country the quality is not so good, and for that we can be thankful.

PROFITS FROM AN APPLE ORCHARD

I want now to give you a summary of our work in the Auchter orchard, in an experiment to determine the profits in an apple orchard.

You all know about this orchard — we have discussed it many times. You know it comprises ten acres of thirty-year-old Baldwin apple trees, and that this experiment ran for ten years. The average yield was 116.8 barrels per acre. The acre average for the period was 79.2 barrels of barreled stock and 37.6 of evaporator and cider stock. Reducing these figures to the tree unit we have for barrel stock 2.93 barrels, and for evaporator stock 1.4; or total per tree, 4.33 barrels.

The first item of cost to be considered is interest on investment. What is a Baldwin orchard in full bearing worth? We will suppose the value to be $500.00 per acre and the interest five per cent. This includes not only cost of land, trees and labor, but deferred dividends of the first ten or twelve years. It is sufficient, too, to cover the expense of house and barns. The first expense is $25.00 per acre on investment, a sum which, divided by 116.8, the number of barrels per acre, gives a charge per barrel of 21 cents as interest on investment. Since this orchard is part of the general farm, only an estimate can be made of the general taxes. The taxes were $1.50 per acre, making the tax on each barrel 1.2 cents.

The next account to be charged is depreciation in teams and tools, and interest on the money invested in them. First-class machinery for running the average orchard will cost in the neighborhood of $1,000, as follows: team, $400; harness, $50; wagon, $75; spraying outfit, $250; plows, harrows, ladders, crates, pruning tools, etc., $115. If we set the depreciation and interest on money at 20 per cent for the above equipment, we must add 17 cents per barrel for the depreciation account. This is rather high, because the ten-acre unit is too small. This same equipment would possibly take care of forty or fifty acres.

The annual cost of tillage per acre was $7.39, making the amount to be charged against each barrel of fruit 6.3 cents. The price paid for team work at first was $4.00 per day of ten hours, but advanced to $5.00. For the cover-crop in this orchard must be added $2.74 per acre for seed, or 2.3 cents per barrel of apples. The expense of pruning per year, per acre, was $3.56; since there are twenty-seven trees to the acre in this orchard, the cost per tree was 13.1 cents. The cost per barrel of apples was 3 cents. The average price paid for the work was $2.00 per day of ten hours.

The average cost for spraying per acre was $11.28; per tree, 41.8 cents; per barrel of apples, 9.6 cents. That was rather higher the past ten years than it will be for the next ten years, because of the great improvement in spraying.

The last of the cost of production charges is that of superintending the work. The station paid $300 per year. The work of any one of you who superintends the hired help is worth more than that of the hired man. If you have an orchard of ten, twenty or thirty acres, you ought to charge up more to your own services than the two dollars per day that you charge up for the hired help.

Picking, packing, sorting and hauling have been done in diverse ways during the ten years; and the items cannot be segregated. The total cost of these operations has been 24.4 cents per barrel.

The following is a summary of the cost sheet for a barrel of apples:

Interest on investment	$0.21
Taxes	.012
Tilling	.063
Pruning	.03
Spraying	.096
Cover-crop seeds	.023
Superintending the orchard	.25
Picking, packing, sorting and hauling	.244
	$0.93

The total cost was 93 cents, not counting the barrel. The average price of barrels for ten years has been 36 cents each, the price fluctuating from 36 cents to 40 cents. Adding the cost of the barrel to the cost of production, we have $1.29 as the total cost of a barrel of apples at the shipping point.

We come now to the average price of apples in the last ten years. We have received an average of $2.60 for all the barreled stock sold, which includes firsts and seconds. For evaporator and cider stock we have received 72 cents a barrel. The average yield of the orchard for the ten years has been 79.2 barrels of barreled stock per acre, and 37.6 barrels of evaporator and cider stock.

We are now ready to calculate profits and declare dividends. Subtracting $1.29, the cost of a barrel of apples, from $2.60, the amount received, we have a net profit of $1.31 per barrel for firsts and seconds. Multiplying by 79, the number of barrels per acre, we have $103.49 as the profit per acre for firsts and seconds in this orchard. Subtracting 72 cents from 93 cents (what it cost to grow them), gives 21 cents as the difference between average cost of production and average selling price of culls. Multiplying 37.6 by 21, gives a loss of $7.89 per acre on the culls, leaving the average net profit per acre in this orchard for the past ten years $95.60. Add to this (as we should do) the $25 interest on the investment, and we have $120.60 net, or 24.12 per cent on $500 per acre, as the annual ten-year dividend from this orchard.

DISCUSSION

QUESTION: What did the apples sell for this year?

PROF. HEDRICK: We sold the firsts and seconds at $1.50.

VOICE: I heard a buyer say that apples grown on our heavy soils held up better in cold storage than those grown on light soil.

PROF. HEDRICK: I think that might be the case. Apples grown on cultivated soil keep better than those grown in sod soil.

MR. VAN WAGENEN: We know a great deal about the farm bureau movement. I am not sure just how well Mr. Burritt is known to the people of Orleans county, but I am sure that we will be glad to look upon the face of a man who stands as the head of the farm bureau work in this state.

INTERCROPPING THE YOUNG ORCHARD — FROM AN ECONOMIC STANDPOINT

M. C. BURRITT, ITHACA, N. Y.
Director, New York State Farm Bureau

I have not come here this afternoon to talk upon the farm bureau work, but rather to talk to you a short time about what seems to me is a very important side of this business. Professor Hedrick and Professor Parrott, of course, very properly believe that the things they talk about are exceedingly important. And they are — I do not wish to minimize them. But I think you will all agree with me that the principal reason you are in the business of fruit-growing is that you get your living that way.

I presume a great many of you here are in the business of fruit-growing just because you like it — because it is an enjoyable business. But certainly a prime motive is the profits you can gain from this enterprise. I presume many of the older men here, who have been in this business for a long time and have accumulated a considerable amount of profit from it, are not so much interested as some of you younger men — you men who have apple orchards inherited from your fathers. You inherited them also at a time when the business was profitable. You do not know just how much those orchards cost. Some of us are finding out how much, and we are concluding that it is no small amount of money. Those of you who have large orchards already, and can simply take the profits out of these older orchards and grow younger orchards with them, do not mind it so much; but the younger men just starting out find themselves confronted with a very serious problem — paying expenses as they go along.

It is necessary that we know the cost of production, and it is along this line that I shall talk to you. I want to say this: I have kept accurate records on my own farm (where we have about twenty-five acres of orchards) for about twelve years, and my figures on the cost of growing apples agree substantially with those of Professor Hedrick, with a few cents exception — which, of course, is inevitable. But I fear that these figures are just a bit misleading. Large profits have been shown from this Auchter orchard, and large profits have been shown from other orchards. Professor Hedrick has said that the average net profit from this orchard was $95 an acre. The average profit from my orchard was $83 per acre. But, as I have said, I do not know how much that orchard cost my father. Undoubtedly, if we were to spread the profits over the lifetime of the orchard, the yearly average would be far from $95. We must not forget this in figuring our cost.

There is complaint nowadays that we do not have anything to say about fixing the price of the things we sell, and that is more or less true; but you will not put yourselves in a position to have anything to say if you let these misleading statements as to profits go out. The average New York City man's idea of farming, and of fruit-growing particularly, is that it is a short and sure road to wealth. You are primarily to blame for that. What leads him to believe that? Why, usually the big stories of profits that have been printed. Professor Hedrick has said that the average yield in the Auchter orchard was 116 barrels per acre; that is much above the average yield of this county. The average yield, as shown by orchard surveys, is 70 to 75 barrels per acre. That would make quite a difference in figuring the average cost of production. We are fixing our ideas from figures on some of our orchards that are not quite representative of the average.

Take, for instance, some of the poorer orchards, with many losses due to ravages of scale and other things; you will not get such figures as that! The average cost of producing our barreled apples we do not know. We ought to know. If we are business men it is up to us to find out, and that means some concerted action. I am very glad to know that the Fruit Growers' Association is going to take some action next Saturday along that line. It will be much harder for us to find out what it costs to grow farm products than it is for the merchant to find out the cost of his goods, but that is no reason why we should not do it. We are falling down on the business end. It is up to us, it seems to me, as the Fruit Growers' Association is doing, to take some steps to obtain accurate records on a large number of farms in this community, that will establish something near an average cost. And when you educate the people in the city as to just what it costs to grow products, you will not have these stories going around of big profits, and you will not have so many difficulties in getting good prices.

The very fact that the subject of milk is being studied is having a very wholesome effect on the market at the present time, and that will tend toward a higher price for milk. We can do the same thing with apples and hay and grain.

WHAT ENTERS INTO COST OF PRODUCTION

There are three general things that enter into the cost of production. The first is labor — man and horse; second, the raw materials that go into the cost of that production, such as fertilizers and manures, cover crops, etc.; and third, the fixed charges, such as interest on the investment, taxes, etc. I know that people say, "Well, if I figured business that way I would not make a cent." Does that make any difference? They are there just the same. You can say you are making $200 an acre from apples if you want to, but you are not gaining anything by it; you are losing. Corporations are always exaggerating their costs; they are always trying to prove that the things are costing more than they do. The cost of our product, in too many minds, is the labor that we have to hire and the fertilizers or seed that we buy. That is no cost at all. You say you will not count the cost of your buildings, or telephone, or other things, but all these items enter in; they are there just the same.

Let us compare the cost of different crops — Table I. Notice how the labor runs up. You can grow an acre of hay for 13½ man-hours; an acre of wheat, 26 man-hours; beans, 43; apples, 175.. Horse labor runs up the same way, but not in the same proportion.

TABLE I

COSTS OF PRODUCING FARM PRODUCTS

FACTORS	PER ACRE			
	Hay	Wheat	Beans	Apples
Labor				
Man hours (20c.)	13½	26	43	175
Horse hours (15c.)	14½	43½	55½	66
	$4 90	$11 72	$16 88	$45 00
Materials				
Fertilizer	......	$3 88	$5 14	....
Manure	......	......	......	$2 86
Cover crop	......	......	......	1 57
Barrels (78)	......	......	......	28 13
Spraying material	......	......	......	3 69
Seed	$1 74	1 92	3 10	....
Threshing	......	1 30	82	....
Total	$1 74	$7 10	$9 06	$36 25
Other and fixed				
Interest	$5 00	$5 00	$5 00	$15 00
Taxes	40	40	40	1 19
Equipment	72	1 71	1 96	6 38
Overhead	52	99	1 86	5 83
Total	$6 64	$8 10	$9 22	$28 40
Grand total	$13 28	$26 92	$35 16	$109 65

Of course these prices will vary on different farms. Some men can handle their business so well that they get man labor for 15 cents to 18 cents an hour. Horse labor varies from 15 cents to 25 cents; the average is a little over 15 cents an hour. Every time you take a team out of the barn it probably costs about 30 cents an hour for that team, without a driver. We do not always think of that.

Note the total cash cost here — $7.10 on wheat, $9.06 on beans, $36 on apples; notice, too, that the fixed costs which we so many times ignore, are a very important part of it. I do not give you my figures to set up an average; these must be determined on every farm. I have merely pointed out some of the costs that enter in.

VALUE OF INTERCROPS

A very important part of the business of growing an orchard of a bearing age is getting the money to do it with. It is all very well, if you have an old orchard paying dividends, to put it in this young orchard — that is your privilege. But some of us cannot do it; we have to pay our way as we go along. I look at the intercrop this way: all the profits I can get out of the crop between the trees, no matter what it is, I am so much ahead. I have made that much less investment in the orchard. If I have to spend ten dollars an acre per year, and if I can get five dollars out of the crop, I am just so much ahead. That is certainly one advantage; it lessens the wait for returns. Much is said about getting profits from orchards in five or six years, but the average man does not do it. We are more apt to set our standards by some individual who has been especially successful. Somebody has an orchard that has made a big profit at the end of five or six years. That is noted in a local paper, which goes to the cities, and it is taken by the public as an average. It is misleading. On an average, an apple orchard does not pay a profit for ten years, and I am not sure but that it is fifteen years instead of ten.

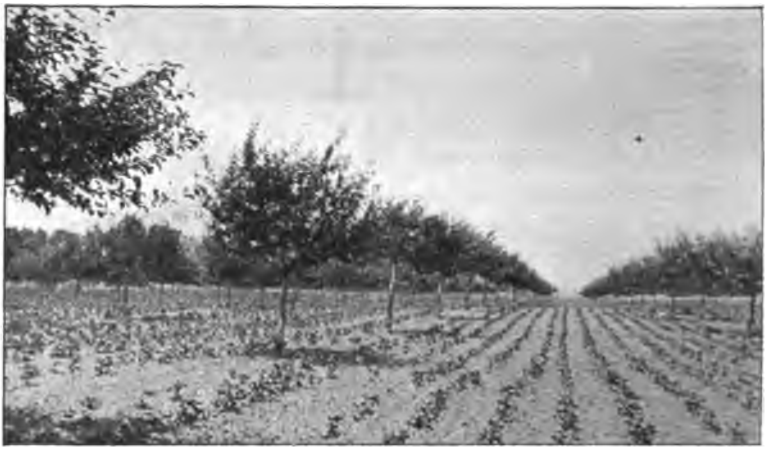


FIG. 553. BEANS IN THE YOUNG ORCHARD.

Furthermore, the growing of crops between trees increases the turn over of labor and materials on a farm. Professor Warren has quite conclusively shown, I think, from the records on something like 3,500 farms in this state, that the large business is the most profitable business. You can sometimes enlarge a farm by growing two crops on the same land, just the same as by buying more land. If you can grow a crop of cabbage, beans or what not in your young orchard, you have increased your business. Every farm must have so much labor — you hire one man or two men for a year. Some of the time that labor is well used, and some of the time you have to hunt around a little to find something for the men to do. That man, as a rule, gets the largest net returns, who occupies the time of his men most effectively — keeps them working on crops.

Then take the matter of horses. It costs $120 a year, on an average, to keep a horse, and our figures show it is nearer $140. Whether you work that horse part of the time or all of the time, you have to pay for his keep just the same. The average farm horse does not work much more than one-third of his time. If you can find something for that horse to do that brings in money, you have made some gain. At the same time you are using your man and your machinery more effectively. The more service you can get out of your land, machinery, and labor — man and horse — the better off you are.

The disadvantages of intercrops are their inconvenience. They increase, slightly, the expense of cultivation. In the case of some crops we have the inconvenience of spraying and of harvesting. We all know these inconveniences and we may as well admit them. But, if it pays in financial returns to put up with them, we had better do it.

ACTUAL RETURNS AND EXPENSES

I shall give you some figures: first, on a twelve-year-old apple orchard set thirty-six feet each way, filled one way with plums and pears so there is a space thirty-six feet wide running one way. On this 7½-acre orchard, containing something over two hundred trees, we have spent, in the last twelve years, $1,579.50, or $208.93 an acre. We have secured a gross income from that piece of land of a little over $1,438.55 or $190.28 an acre. Of course this cost includes interest on valuation. We now value it at about $225 an acre. That piece of land still owes us $140.95, or $18.66 an acre. In other words, after paying for all the labor and five per cent interest on the capital invested in the land, we still lack nearly $141 of breaking even at twelve years. The total income was obtained from the orchard itself, from plum and pear fillers, and from intercrops.

TABLE II

COSTS, INCOME, AND PROFIT AND LOSS ON A 7½-ACRE, 12-YEAR-OLD APPLE ORCHARD FILLED ONE WAY WITH PLUMS AND PEARS

YEAR	Cost of orchard	Income from orchard	Loss on orchard	Income from crop	Net profit or loss
1903	$116 39	....	$116 39	$15 17	—$101 22
1904	161 57	....	161 57	42 57	—119 00
1905	96 63	....	96 63	43 13	—53 50
1906	93 18	....	93 18	120 90	+27 72
1907	96 73	....	96 73	38 85	—57 88
1908	67 85	....	67 85	37 68	—30 17
1909	87 61	$41 90	35 71	O {61 32 S {39 29	} +64 90
1910	101 12	38 65	62 47	60 70	—1 77
1911	93 23	38 00	55 23	30 45	—24 78
1912	159 80	30 56	129 24	52 43	—76 81
1913	235 26	229 28	5 98	194 88	+188 90
1914	270 13	252 63	17 50	170 16	+ 52 66
12 years	$1,579 50	$631 02	$948 48	$807 53	—$140 95
7.5 acres	208 93	83 47	125 46	106 80	—18 66

Labor rates used in figuring crop profits vary according to season.

The $208.93 total cost was made up of $43.12 man labor, $27.20 horse labor, and $138.61 for materials and interest. The income from that orchard was $807.53 from crops, or $106.80 an acre for the twelve years; that is, a little less than $10 an acre per year for crops. We charge the interest and taxes and overhead charges all against the orchard; it is net, so far as the piece of land is concerned. From the plums and pears we obtained $415.44, and from the apples $215.58, or about $28.50 an acre.

Had we not intercropped that orchard, it would have owed us more than it does now. Had we grown simply an apple orchard without any fillers, and without any crops, that orchard would have cost us an actual outlay of about $260 an acre, instead of $200. For me, that is sufficient argument for growing crops between the rows. In giving you these figures I am not setting up any standard, because I know some of you have made two or three times as much as this from intercrops, and some of you have not made anything. I simply call it to your attention. I am thoroughly convinced, so far as I am concerned, that it pays to fill young apple orchards, and that it pays to grow crops between the rows. The crops we grew were as follows: corn, beans, beans, beans, beans, and corn again. Then we put in oats, wheat, and two years of hay, and then went back to wheat and beans again. Of course you understand that you have to grow your intercrops farther and farther from the tree rows each year. We now keep a full harrow width on each side of the tree for cultivation, having gradually widened the distance each year.

As to the income from these various crops, I do not feel that I can give averages, except in one or two cases. So far as we have tested, beans have averaged $8.40 per acre net profit for five years, charging interest and overhead expense to the orchard; corn, an average of $3.50 for the two years that we grew it; hay, $5.50, and grain, $8.15 for the two years. Peas gave us a profit of $25 an acre, but that was two years ago when we had a good crop. Last year we did not try to grow peas.

You all know the relative advantages and disadvantages of growing these various crops. You know, for instance, that corn between the tree rows is not advantageous to the trees in many cases. You know the trouble in harvesting — I will not go into that. I have given you these figures to show you some of the possibilities of these crops.

APPLES WITH PEACHES AS FILLERS

Before closing, I want to tell you about one other orchard. This is an apple orchard filled both ways with peaches. It is a ten-acre orchard, but I shall give you the figures only on that half which is now seven years old. I shall give you the figures for the first four years. It cost us $84 an acre to grow this orchard. During this period we obtained a gross income of $313.13, or a little over $62 an acre, leaving a net loss of $107, or a little over $21 an acre at the end of the four-year period. The man labor was 15 per cent of the cost, the horse labor 20 per cent, and material and overhead charges about 65 per cent.

In this orchard we grew four crops of beans, successively. It was filled both ways with peaches, so there was not much space. We grew six rows of beans the first year and four the second, third and fourth years. The last crop was very small. From these four crops of beans we obtained a net profit of $267 (again not charging the interest and overhead expenses against the crop, but against the orchard), or $53 an acre. From the fillers we obtained a profit which was a little less than $10 an acre the fourth year.

TABLE III

COST OF GROWING 5 ACRES OF APPLES AND PEACHES TO FOUR YEARS OF AGE

YEAR	MAN LABOR		HORSE LABOR		Total labor	Material and fixed costs	Total
	Hours	Cost (18c.)	Hours	Cost (15c.)			
1908	124	$22 32	36	$5 40	$27 72	$106 03	$133 75
1909	63½	11 43	74½	11 18	22 61	65 14	87 75
1910	58	10 44	24½	3 67	14 11	71 05	85 16
1911	162	29 16	63	9 45	38 61	75 00	113 61
Total	......	$73 35	......	$29 70	$103 05	$317 22	$420 27
Acre (5)	......	$14 67	......	$5 94	$20 61	$63 40	$84 01

SUMMARY OF THE COST OF A 4-YEAR-OLD 5-ACRE APPLE AND PEACH ORCHARD

YEAR	Crop grown	Net income from crop	Income from orchard	Cost of orchard	Profit	Loss
1908	Beans	$63 37	....	$130 12	....	$62 75
1909	Beans	66 70	....	85 03	....	18 33
1910	Beans	79 81	....	83 39	....	3 58
1911	Beans	53 20	$46 05	61 95	$37 30	....
		$267 08	$46 05	$360 49	$37 30	$84 66

Total cost per acre, exclusive of income	$72 10
Total cost per acre, including income	9 47
Total net cost per 100 trees	4 73
Total net cost per apple tree	376
Total net cost per apple tree, excluding income	2 86
Average net income per year (excluding interest and taxes), beans	66 77
Average net income per year (excluding interest and taxes) per acre	13 35

In this orchard, instead of having an investment of $72.10 an acre at the end of four years, we have an investment of only $9.47, due chiefly to the fact that we have grown crops between the rows. I may say that in the last two years this orchard has borne peaches enough to more than defray its entire cost. And this apple orchard, seven years old at the present time, filled with peaches still in their prime, has not only paid the entire cost of growing all the trees, but has returned a profit of something like $16 an acre.

Perhaps these two cases represent a variation that all of us will find more or less. In one case we have an orchard that is still in debt and in which we have not broken even at the end of twelve years, whereas another orchard has made some profit at six years. You will find all these variations.

CONCLUSIONS

If we are in this business for the profit there is in it; if we do not care to make a heavy investment in the growing of young orchards, and wait ten to fifteen years for returns from them, I am fully convinced that intercropping and interfilling is a profitable practice, from an economical point of view.

MR. VAN WAGENEN: We have a few minutes to devote to a discussion of this topic. The time belongs to Mr. Burritt.

DISCUSSION

QUESTION: When oats and wheat were sowed, did it not affect the space?

MR. BURRITT: I do not think it did. Of course you understand we did not put this grass and grain under the trees — we left a strip so that we could give the full amount of cultivation. We have taken good care of the orchard. There is still twenty feet in the middle. The probabilities are that the trees do not grow on that at all, and you might as well use it for grass or grain. In fact, I have practically come to the conclusion that if I had an orchard filled only one way I should carry on my regular farm rotation in that orchard, whatever it was. If I had it filled both ways I should not do that.

QUESTION: Do you plow close to the tree?

MR. BURRITT: We do, and give it good, thorough cultivation.

MR. VAN WAGENEN: I believe at this time I am to say the "closing words" to you. There is one advantage in being a conductor — like a woman, you have the last word.

We have had men here from Cornell and from Geneva (and I can say these things because I am a farmer myself) who are recognized as the leaders in their particular line of investigational work, and for that reason we do not need to apologize for this meeting in any way. And yet I suppose that in every place there are statements made regarding agriculture, which, in the days to come, will prove not true. I doubt, after all, if that is any general condemnation. And there are some things which we deem agricultural truth, which in the years to come may prove false. Yet the only things that do not change are the things that are real, and that is so in agriculture — it is a living science.

In giving you what impressions I may have, it will be to give you, perhaps, my confession of faith regarding Farmers' Institutes, and should you go out of here and say, "These men came here, and after all I do not know as they know as much as I do," I should regard that as very severe criticism.

I want to take this opportunity to pay my respects, if you will, to the man of the laboratory and to the man of the library. I want to say this to you, that while I recognize the value of the so-called practical man, you and I must recognize the necessity, to our business, of the so-called scientific man or the technical man. If there had never been anyone in this world but the practical potato growers, the potato bugs would have eaten all the potatoes up, and we certainly should never have heard of bordeaux mixture. If it were not for the men in the laboratory and library digging out these truths, you men would have been absolutely powerless to have any control over the San José scale or apple scab or many other things. You must recognize the value of the scientific man.

One other thought: we have been here three days and talked mostly about soils, crops and cattle, and I am not sure that we have done as well as those people on the other side of the road, who have been talking about the problems of the home life and the boy and girl. I am sure that you and I need one thing, and that is more of the spirit of farm patriotism; more of the belief that the spot where we live is the best one.

I shall tell you a story. There lived somewhere to the south and east of us an old farmer in an old house, and he had a beautiful farm that ran down to the shore of the lake. He was born there and had lived his life there, and loved the spot. One day there came along a very rich man from the city, a man who had gone to the city and had piled up millions, and he coveted the old man's place. He went to him and said, "I want to buy your farm." The farmer replied, "I do not care to sell it." "You do not understand me," said the city man, "I did not come here to dicker with you for a thousand or two thousand dollars less; put a price on it." The old man turned on him and said, "Man, what do you mean? I am going to die there in that old room where I was born."

If you look on life in that light, you will find life on the farm worth living. The true test of farm life is not, after all, in the last analysis, the dollars you can get out of it. I cannot conceive of a happy, prosperous community furnished by an impoverished soil; if we are to have the highest type of farm civilization we must make the farm pay in dollars and cents, and we want to travel and educate our children and do all those things which make life worth while. Yet sometimes men have been successful but have forgotten the school and the church and the rural community, and all those things which go with that success. I want to say this to you: when we American farmers shall take our place in the gallery of time — when we are given the place we shall occupy in American history — we are going to take that place, not by virtue of the bushels of grain we produce or the millions of wealth we accumulate, but by virtue of the type of manhood and womanhood that we grow on the farm.

As I have thought of this question of farm life, and the little people that are growing around my hearthstone today, there is nothing I wish for them more than that they might live by the soil as their father did. I have come to believe more and more that the problems of farm life, which must be settled, are the problems of a higher standard of citizenship on our farms. We must be better farmers.

I heard an old Baptist clergyman in the hill valleys of my own county, in a prayer, say: "O Lord, Thou knowest that we ought to be better men and farmers." So, a farming community that will stand for better things for the school and church and home, and stand against the saloon and against everything else that is mean and low and vile — if you and I can have that, we will show the world how fine it is to be an American farmer on an American farm.

I shall now say good-by to you. I have been here before and we are beginning to get acquainted. I hope that all the good things will come to you during the coming year. The poet says that when the eastern people meet they say, "May your house and children overflow." The Old Testament lines read, "May all your threshing floors be full of wheat, and may all your vats overflow with corn and wine." And if I should translate that to-day it would be this: "May all your orchards be covered with bloom in May, and may they all break down with apples in October." I bid you, for another year, good-by.

Meeting adjourned at 5 P. M.

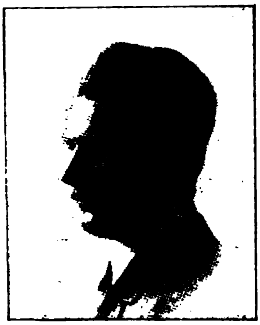
SPECIAL POULTRY SESSIONS

TUESDAY, MARCH 16

SOME RECENT POULTRY INVESTIGATIONS MADE AT CORNELL

R. S. MOSELEY

Poultry Department, Cornell University, Ithaca



As the conditions of the country last year were such that it made grain high in price and did not materially affect an increase in the price of eggs and meat, the poultrymen began to grow uneasy. In some instances farmers sold whole flocks, for fear the price of grain would keep going higher and thus make it impossible for them to make money from poultry.

While the high price of grain handicapped the poultrymen, there is no reason for worry, as shown by some farm poultry surveys taken by the college recently, which indicate that there are still profitable returns with poultry, if well managed.

The high prices are making some poultrymen more thoughtful in so caring for their poultry that they will be able to obtain the best there is in them. We can make as much money as formerly, or more, if we carefully study our methods to find out the weaknesses, and remedy them. It may be that the ration could be cheapened; that our stock could be graded better for vitality, or that the flock might be selected more carefully for laying qualities so there would be no drones to reduce the profit of the whole flock.

Farmers from all over the state wrote the college asking what they should feed in the Cornell ration (or in some other ration) instead of wheat. It was with this in mind that A. B. Dann of the Department of Poultry Husbandry made a study of the feeds to formulate a ration that would be cheaper than the Cornell ration. A survey was made of the different rations for laying hens recommended by twenty-five experiment stations in the United States, Canada and abroad. It was found that there was a remarkable difference in the variety of the grains used, and the nutritive ratio thereof. Twenty-nine different feeds were used in these rations The nutritive ratio of the ration (the ratio of the number of pounds of portein to carbohydrates and fat) varied from 1 to 3.3 up to 1 to 6.9.

The great variation of figures as to the ratios would indicate that it was safe to expect that we could use a more varied ration than was usually thought, and secure good results. Hence, a ration could be made more on an economical basis, taking into consideration what we could buy at lowest cost per 100 pounds of total nutrient. The knowledge of the digestive power of a hen is so limited that it is impossible to set any exact standard for a ration.

However, the following table was worked out on the basis of total nutrient per 100 pounds, cost per 100 pounds feed and per 100 pounds total nutrient.

Feed	Total nutrient in 100 lbs.	Price per 100 lbs.	Cost per 100 lbs total nutrient
Corn	84.3	$1.60	$1.90
Oats	67.7	1.85	2.73
Wheat	79.7	2.50	3.14
Buckwheat	61.7	1.50	2.44
Barley	77.3	1.70	2.20
Peas	74.2	2.50	3.37
Corn meal	78.3	1.60	2.04
Ground oats	70.9	1.85	2.61
Wheat midds.	68.8	1.70	2.47
Wheat bran	55.5	1.50	2.70
Alfalfa meal	52.8	2.00	3.79
Gluten feed	80.6	1.65	2.05
Buckwheat midds.	73.9	1.60	2.16
O. P. Oil meal	77.7	2.00	2.57
Beef scrap	96.3	3.00	3.12

The second column gives the total nutrient of the feeds given in column 1. The total nutrient is found by adding the digestible protein and carbohydrates to the total fats multiplied by two and one-fourth. It is considered that one pound of fat is worth as much in food value for heat or energy as two and one-fourth pounds of either protein or carbohydrates.

This table shows there is a remarkable difference in the cost of total nutrient per 100 pounds of feed. The most economical feed is corn, which was $1.60 per 100 pounds when this table was worked out. Wheat, which was $2.50 per 100 pounds, was most expensive. The real food value per 100 pounds is determined by cost per 100 pounds of total nutrient.

COMPOSITION OF POULTRY, EGGS AND CORN (PER CENT)

	Water	Ash	Protein	Fat	Carbohydrates
Hen's body	55.8	3.8	21.6	17.0	....
The egg	65.7	12.2	11.4	8.9	....
Corn	10.6	1.5	10.3	5.0	72.6

Hens apparently will not do so well on one grain as on a variety. All the different forms of nourishment cannot be obtained in one kind of grain, as shown, for instance, in this table with corn, which is the most economical feed we could buy. Corn is more of a heat and energy producing feed (containing 72.6 carbohydrates) than some of the other grains, and if it were fed too freely there would be a great waste, because the hen could not make use of all of it either for her body or for the egg.

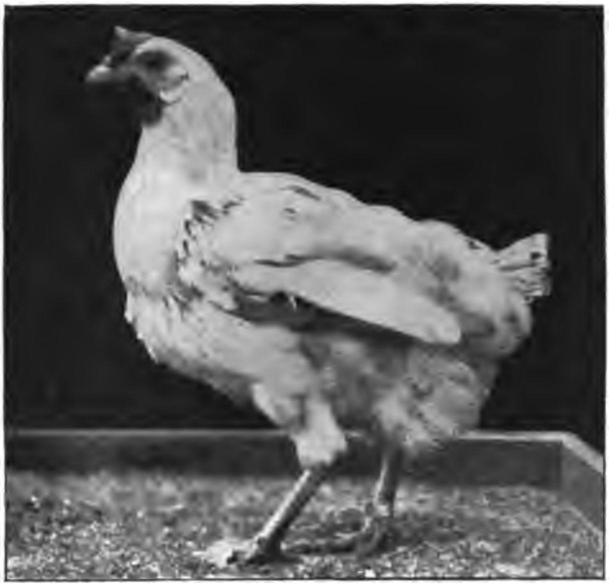


FIG. 554. HEN NO. 61 IN HEAVY MOLT, NOVEMBER 28, 1906. OBSERVE THE OLD PRIMARY AND SECONDARY FEATHERS UNSHED, WHILE THE NEW BODY AND TAIL FEATHERS ARE PARTIALLY DEVELOPED AND THE NECK FEATHERS ARE GROWN. RECORD 213 EGGS IN 261 DAYS, JANUARY 24 TO OCTOBER 12, 1906.

The lack of enough protein and the excess of carbohydrates in corn illustrates the desirability of using more concentrated foods such as beef scrap, wheat middlings and others.

The following table shows how the economic importance of feeds could be utilized in the Cornell ration for laying hens:

Standard Cornell Ration	Pounds	Possible Modification	Pounds
Corn	60	Corn	60
Wheat	60	Barley	30
Oats	30	Oats	30
Buckwheat	30	Buckwheat	30
Corn meal	60	Corn meal	60
Wheat midds.	60	Wheat midds.	80
Wheat bran	30	Wheat bran	40
O. P. Oil meal	10	O. P. Oil meal	10
Alfalfa meal	10	Alfalfa meal	10
Beef scrap	50	Beef scrap	50
Salt	1	Salt	1

The nutritive ratio between the Cornell and the modified ration has been changed very little, but the price has been lowered about 15 cents per 100 pounds. In some sections of the state, wheat is from $2.75 to $3.20 per 100 pounds and barley but little more than quoted in this table. It can be seen that there would be a saving of at least $3.00 a ton or more, depending on the price of wheat.

Barley has an analysis somewhat similar to wheat, but is not so palatable, and therefore the hens do not take to it so readily at first. It would be well to work the barley into the ration gradually so they will become accustomed to it. It can finally be substituted entirely for the wheat. Buckwheat could be left out of the ration in the summer time.

Other changes may be made according to the feeds available and the prices thereof. Where discarded or split peas can be obtained at seed houses or elsewhere, at a reasonable price, they make a very desirable addition or substitute. When sour milk can be bought for ten to twenty-five cents a 40-quart can, meat scrap can be reduced 50 per cent in the ration.

The most important considerations in making a ration are: price per 100 pounds nutrients, palatability of the feed, bulkiness and fiber.

METHOD OF SELECTING HIGH PRODUCING HENS

Culling the flock is more important than reducing the cost of feed, for if we eliminate the unproductive hens we do away with feeding them, whether grain is high or low in price. Even in the best of flocks a certain percentage of the pullets could be culled out because of lack of vitality or hereditary characteristics. In some flocks 50 per cent or more could be culled out because they lacked the ability to lay satisfactorily.

What we need to encourage is a higher average egg production per flock rather than number of hens. The cost of labor will thus be reduced, a saving on cost of feed realized, mortality reduced, disease lessened, and the vitality of flock increased. Eggs for hatching could be sold at a reasonable price, and work would be more interesting and profitable because of the better attention given to the fowls.

Constitutional vigor should be the first consideration in any flock. Repeated experiments have shown that fowls of low vitality will not give as good egg production as those of high vitality; that eggs from hens of low vitality will not hatch so well, and the progeny from the weak hens will also have a tendency to inherit weak qualities of their mothers.

Ways of selecting high producing hens are: by texture of comb, color of shanks, use of trap nest, color of earlobe, and time of molting.

TIME OF MOLTING

Experiments and observations made at this station in connection with trap-nest records have shown, as far back as 1907, by Clara Nixon, that early molters — hens molting before September first — as a rule are low producers, and late molting hens higher producers. Another series of observations were made October 1, 1914, by O. B. Kent.

The ration and method of feeding affect time of molt to a certain extent. For instance, leaving meat scrap or concentrated foods out of a ration and then adding it after a period, has the effect of starting molting. If fowls are kept under normal conditions of housing, care and feeding, the time of molting indicates very accurately the value of the hen as a layer. It has been found that molting is very nearly as good a test of production as color of shank.

Some poultrymen hold the early July and August, or possibly earlier molters, through the fall, expecting a large quantity of winter eggs. It is a known fact, however, that such do not start to lay so early, or produce so many winter eggs as the late molters. Then why should we keep the early molters to board through the late summer and fall, and part of the winter, for an uncertain number of eggs that in many cases amounts to less than cost of feeding? The greater part of our winter egg production should be expected from the pullets.

The late molters grow plumage much more quickly than the early molters, and prepare for another year of heavy laying. Late molters also make good breeders because they have a resting period — during time of molting — that comes just before the breeding season. After this vacation, they start in to lay with renewed energy, thus giving good strength of germ to the eggs.

COLOR OF SHANKS

In the summer and fall of 1911 a method of determining the production of fowls by color of shanks was discovered at Cornell. It was found that in the yellow-skinned birds, the paleness of shank was a very reliable indication, if taken in the fall, at the end of the first year. October 1, 1914, another series of observations to test out the accuracy of the first observation were made. The data secured last fall showed that any bird that had shanks as dark as a light lemon color was a poor producer. All of the high producers, and some of the low-vitality low producers, had faded-out shanks. This test for egg production holds good when a hen has a yellow shank at the beginning of the laying season.

The reason for the color leaving the shank is because of excessive drain on the system in supplying coloring matter for the large amount of eggs laid.

TEXTURE OF COMB

Observations were made last fall by Mr. Kent at Cornell to find the relationship of the comb to laying powers. It was found that those fowls which had soft, pliable combs when observations were made October 1, 1914, were, in general, better producers than those that had hard or shrunken combs. This may be explained on the basis that, as a bird molts, its comb tends to shrink and become hard. Those hens that are in good condition or are laying have pliable combs.

TIME OF MOLT, COLOR OF SHANK AND TEXTURE OF COMB, AS INDICATIONS OF EGG PRODUCTION

The First Ten Hens of Pen 27

Bird No.	Time of molt	Color of shank	Texture of comb	Total	Egg production
3154	1	1	1	3	173
3157	1	1	1	3	224
3159	1	1	1	3	177
3175	1	1	1	3	257
3163	1	2	1	4	187
3164	2	1	3	6	155
3176	4	2	2	8	121
3191	4	2	3	9	106
3162	3	1	5	9	119
3158	3	2	5	10	92

From the three characters — color of the shank, time of molting and texture of comb — a correlation table was constructed to show their relation to egg production. In order to do this it was necessary to grade each factor numerically. All birds which had failed to molt or were just beginning to molt were put in grade 1. A bird that had completed its molt was put in grade 5. Intermediate degrees of molting were numbers 2, 3 and 4.

Color of shanks was graded in the same manner. Those birds having practically no yellow color present in their shanks were put in grade 1. Those having golden yellow shanks were put in grade 5. Intermediate degrees of yellow were numbered 2, 3 and 4.

The texture of the comb was graded in the same way, grade 1 being a soft and pliable comb and grade 5 a hard and stiff comb. Number 2, 3 and 4 were intermediate grades.

The foregoing table shows how the factors were graded and gives an idea of how reliable each of the three methods are. It shows how closely the three methods of determining egg production — by texture of comb, color of shanks and time of molting — agree. Very few individuals which scored less than 6 failed to lay less than 120 eggs, and there are comparatively few individuals which scored more than 9 that laid more than 100 eggs.

This shows that it is readily possible to go through a flock of White Leghorn hens about October first and tell very closely the hens that have been high producers and those that have been poor producers. A similar correlation table for the second year gives practically the same results.

COLOR OF EAR LOBES

The Connecticut Agricultural Experiment Station, Storrs, Connecticut, found that the breeds that have yellow pigment in their ear lobes before they lay, will lay this yellow color out. The reason for this would seem to be that the yellow pigment is gradually used up in the body after she lays her first few eggs, just as the yellow pigment is used up from the shanks if the hen is a heavy layer. There are certain strains of show birds, however, that, because of careful selection year after year for white ear lobes in the male as well as in the female, even when the hen is not in laying condition, do not show yellow pigment in the ear lobe at any time. Yellow in the ear lobes, as well as deep yellow shanks, will be found in most all of the utility strains of White Leghorns. O. B. Kent found, in testing this method on the Cornell Single Comb White Leghorn, that in practically every instance the hens or pullets were laying according to expectation based on their earlobe color.

EGG PRODUCTION BASED ON AGE, UNDER NORMAL CONDITIONS OF HATCHING, REARING AND FEEDING

Three calendar year records of one hundred and sixty-nine S. C. White Leghorns at Cornell University

Early Egg Production as an Indication of Prolificacy

GROUPED ACCORDING TO AGE FIRST EGG WAS LAID	Number hens	Percentage of total	Average age when first egg was laid	Average production first year	Average production second year	Average production third year	Average total per hen for first three years
151 to 240 days......	127	75.15	208.32– 6.9 mo.	150.6	128.67	112.54	391.31
241 to 1,110 days.....	42	24.85	299.88– 9.9 mo.	95.55	111.81	99.00	306.36
Total...........	169	100.00	231.08 7.7 mo.	136.92	124.48	109.18	370.57

Pullets that lay early in a flock of the same age will lay more during the year than those that start in later, as shown by many experiments at the college. Early laying is an indication of prolificacy as shown by the above table.

This table shows clearly that the number of S. C. White Leghorn pullets at this station that can be saved, based on their production until eight months of age, covers about 75 per cent of the flock.

The white ear-lobe test seems to be the most practical that we have at the present time for the first selection. To make this test, catch pullets just as soon as the ear lobes show white, legband and put them in another pen, preferably in the same building. Continue this until the pullets are about eight months old. In case it is desired to select red ear-lobed breeds for early layers, the trap nest would have to be used during these months.

For later selection of pullets and fall selection of hens, the color of the shanks, texture of the comb and late molting may be used to advantage.

The trap-nest system of selecting layers is quite expensive if used for any great length of time, and it is for this reason that many poultrymen are judging the laying powers by external characteristics. Culling should be practiced at all times of the year, if one desires to produce a flock that will prove economical with the food, and give the greatest returns for amount of money and labor invested.

POULTRY BUILDINGS

DR. E. M. SANTEE, CORTLAND, N. Y.

Bureau of Farmers' Institutes

The laying house should be conveniently located on well drained soil, protected as much as possible from prevailing winds, and should face slightly east of south. It should have tight, dry floors, tight side walls and tight roof. The walls should be so constructed as to be kept free from vermin easily. They should be deep enough to allow the perches to be well back from the front, on account of draughts. The size should be regulated by the number of fowls kept. For large flocks the continuous house made up of compartments 20 feet square, seems to be considered ideal by most of our best poultrymen. The single sloping roof with the back 5 feet high and the front 7½ to 9 feet is coming to be adopted more and more. Concrete makes the most satisfactory and economical floor. It need not be more than three inches in thickness if the ground is well firmed or filled in with stone, and tamped. To secure a dry floor is one of the hardest things connected with this part of the work, and one of the most necessary. A thickness of from eighteen inches to two feet of stone, covered with concrete, is fairly satisfactory. Twelve inches of good cinders covered with concrete is preferable to the stone, but the most satisfactory concrete floor is made by burying tar felt roofing between the layers of concrete. A convenient method is to first level and smooth off the ground. Then spread on about one inch of concrete made up of eight parts of rather fine gravel to one part of cement, made very wet and tamped down with a float or a hoe, in order to get a smooth surface. Then roll on single thick tar felt or other cheap roofing, and put on two inches more of the same kind of concrete, floated down while rather wet.

To prevent rats from burrowing underneath, it is always well to dig a trench about 12 inches deep and 6 inches wide around the outside, filling in with concrete. If on soil underlaid with hardpan, where it heaves badly in winter, this foundation should be dug down below frost line and filled with stone, with a tile drain from the lower side.

ARRANGEMENT OF FRONT

Sunlight and fresh air being two of the most important factors, the arrangement of the front is very important. Many prefer to have a continuous opening about three feet wide and about three feet above the floor, covered from the outside with one-inch mesh poultry netting to keep out sparrows and keep in the poultry when desired. This opening should be provided with muslin-covered frames on the inside, hinged at the top; these should be buttoned up to the roof at all times except in stormy weather. This lets in not only plenty of sunshine, but an abundance of fresh air.

Professor Rice has recently given us what he calls his "wind baffler," which is used in the front in place of the muslin door. It is a system of slats so arranged that air can pass in or out very freely when moving slowly, but not at all when attempting to go through rapidly. This seems to give good results, costs no more for original installation, obviates any attention whatever, and will probably solve the ventilation problem of the poultry houses of the future. However, it lets in no sunlight, and glazed windows are required in addition. If two windows are used — and this is preferable — they should be placed in the east and south side of the front. If only one is used it should be in the east, in order that a long ribbon of sunlight may extend entirely across the house at the earliest possible moment in the morning. In the long house it is very convenient to hinge this window like a door and use it for cleaning out. The partitions should be solid, to prevent draughts.

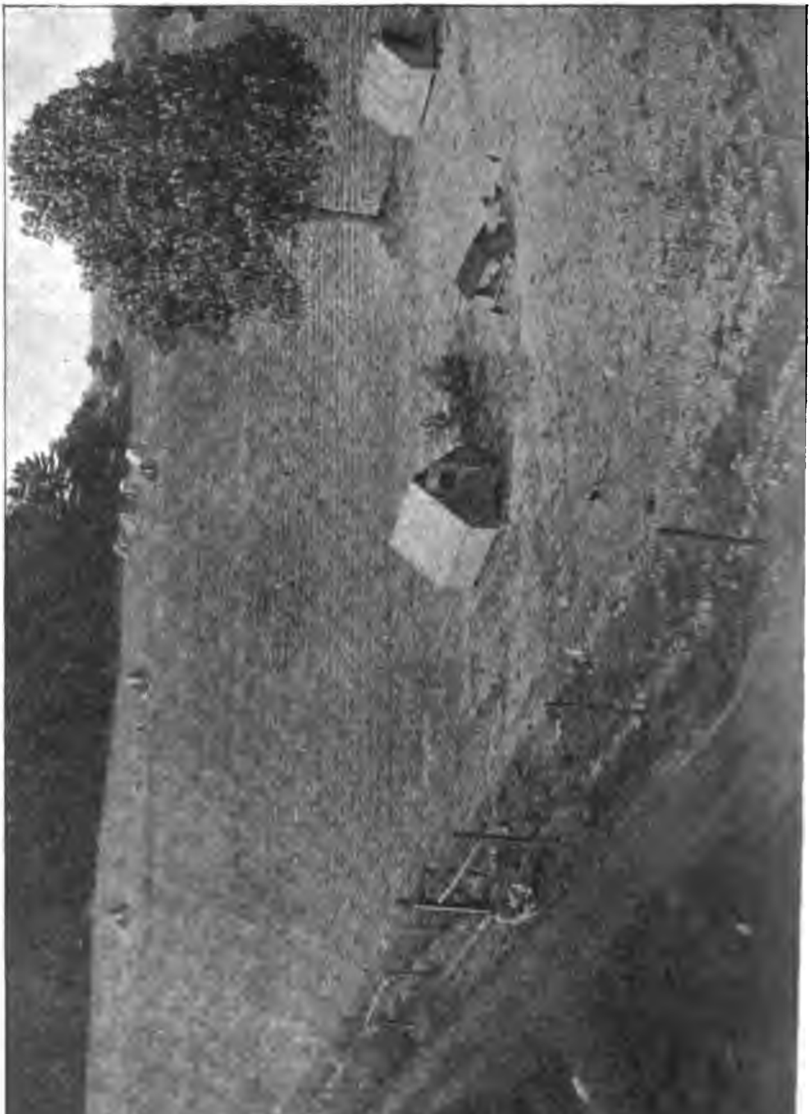
INTERIOR ARRANGEMENTS

The perches should be 6 inches above a smooth dropping board at the back of the house, about 2½ feet from the floor. In the 20-foot-square house there should be 3 perches, for average poultry, the center of the back one being 14 inches from the back wall, the second 12 inches from the first and the third 12 inches from the second. This requires a dropping board 44 inches wide.

FIG. 555. SECTION OF FRONT OF IDEAL POULTRY HOUSE

It is well to have a broody coop about 2 feet wide at one end of the dropping board. This coop should have a slat bottom and a perch. This makes a convenient place in which to confine surplus male birds or broody hens, and does not subject them to a great change in temperature, as removing to another building is apt to do. The dropping board should be made of matched material, always running crosswise and not lengthwise, which makes the cleaning process very much easier. There should be a matched board lining to the timbers back of and over the dropping board to prevent draughts.

Where the back wall is 5 feet high and the dropping board 2½ feet from the floor, the most satisfactory and convenient



The old Church Houses Scattered Over a Meadow Near a Woods. The old Church Hall, [illegible] place for the nests is under the front side of the dropping board. These nests should be so constructed as to be removed easily and cleaned. By placing a 12-inch board, as a removable shelf, 10 inches below the dropping board, for a bottom, it is a simple matter to make the nests in sections of about five so that it can all be easily taken out. This is done by taking 10-inch boards and sawing them 12 inches long, nailing a 2-inch strip on the front and one on the back end, then hinging a 6-inch board to the 2-inch strip on the front side, and arranging a button to fasten at the top. This makes a convenient door to let down for gathering the eggs. The 2-inch strip at the back gives plenty of room for ingress and egress.

A wire bottom to the nests is theoretically very nice; in practice it does not work out so well because when hens are on the nests, the feathers stick down through the wire opening and make a first-class mark for mischievous hens. This, in numerous instances, has developed the feather pulling habit.

The water fountain should be well up from the floor, preferably about two feet. A very convenient arrangement is to make a shelf of slats about two and one-half feet square with an opening in the center large enough to hold a ten-quart galvanized iron pail.

FIG. 557. SIMPLE DRINKING FOUNTAIN AND ROOSTS WITHOUT DROPPING BOARDS

Many are dispensing entirely with the dust bath, depending on spraying the houses to prevent lice. But if the dust bath is placed under a sash, over a pit about two and one-half feet square in front of the house, with a small opening through which the hens may pass to and fro, the most disagreeable features of the old-fashioned dust bath are eliminated, and it certainly gives a great deal of comfort to the hens.

The hopper and dry mash should also be up from the floor on a shelf about two feet high. By placing everything up from the floor more hens may be kept in the same sized room, and they have greater freedom of action.

REARING HOUSES

For rearing houses, the Cornell gasoline colony house type is about the most satisfactory, and most economically built. They are 8 feet square, having the steep "A" roof with 2-foot side walls and 6½ feet in the center. These are placed upon runners so as to be conveniently drawn to any part of the farm, but they are kept near together in the early part of the season until it has become warm enough, and the chicks have grown large enough to dispense with artificial heat. They are then drawn out to the edge of the corn field or the orchard, or any other convenient place where the chicks may have plenty of shade, green food, bugs and worms. These houses, by grouping them, can be used in the winter for surplus hens, surplus male birds, or even for breeding pens of small, select flocks. In plants of any considerable size, it is well to have a spare building for fattening crates and sitting hens, where the sitting variety of poultry is kept.

MARKETING POULTRY PRODUCTS

DR. E. M. SANTEE, CORTLAND, N. Y.

Farmers' Institute Lecturer

Good marketing is the most profitable part of the poultry business. Success in this line depends upon the man and his methods, the size and quality of the market, and the quantity, quality and regularity of the product. The larger cities seem to furnish the best market. Of course the nearness of the market will always be a factor, on account of transportation charges. The regularity of the product is the weakest part of the poultry business.

Professor Rice of Cornell has given us the following table as a guide to the number of eggs that may be expected per day from hens and pullets during the different months of the year:

Month	100 hens	100 pullets
November	10	20
December	15	25
January	20	30
February	30	35
March	40	45
April	55	60
May	65	65
June	55	55
July	50	50
August	35	40
September	25	30
October	15	20

NECESSARY REQUISITES

Since a very large majority of poultrymen are deriving most of their profits from eggs, and selling meat only as a by-product, it will readily be seen that it is very necessary to have some early hatched pullets to supply the demand while the hens are molting in the fall months. Whether the wholesale or retail trade is to be catered to, will depend upon the ability of the man as a salesman, and the evenness and regularity of his production. Success in the egg market requires careful grading. The eggs should be graded as to size, shape and color; the dressed poultry according to size, condition and color of skin.

The package has much to do with success or failure with marketing poultry products. Every package should be neat, attractive, catchy, and have the card of the producer printed or stenciled upon it. A euphonious name of the farm has all the advantages of a trade-mark when it has once gained a reputation for fair dealing and high-class goods.

In the past, a great deal of dissatisfaction has been caused by poor packages, but this problem has been solved by a number of manufacturers. The Thomas Morris Company of Brooklyn makes a very satisfactory package for $4.75 per hundred, to hold a dozen eggs. W. H. Schuman Company of Philadelphia makes a package, and will print the name and card on the package for $7.00 per hundred.

Keeping pure-bred stock helps wonderfully toward evenness of product, but such uniformity depends more upon the time of hatching of the pullets. Many of the large producers are depending upon the commission men, a method that is giving more satisfaction than in times past. Family trade, by means of parcel post, is being worked out and proves very satisfactory.

One of the chief drawbacks to working up a parcel post trade has been that the poultrymen, as a rule, have not been willing to divide the extra profit, which this transportation gives, with the consumer. This is not only unfair but very shortsighted. for there is no other method of marketing so satisfactory when properly conducted. The producer who is fair to the consumer has no trouble in disposing of his product in this manner, as a satisfactory customer invariably quickly grows to two.

The method of fixing the price is very important. Probably there is no better way than to agree upon a fixed premium above the market quotations of Saturday, for the succeeding week. About the least satisfactory is to fix the price for the year. This easily leads to the customer looking for his supply elsewhere when prices are low and the producer selling elsewhere when they are high.

TRADE TERMS

The terms "new-laid," "fresh" and "hennery" mean that eggs have been laid within one week, and, if the highest prices are to be received and customers to be retained, a very strict observance of the requirements of the terms must be followed. As it is impossible to ship eggs without meeting high temperatures in the summer, and as incubation begins at 72 degrees. it may easily be seen that the only safe way is to ship infertile eggs. There is no reason why any fertile eggs should ever be shipped except for breeding purposes.

Every egg that goes into a package to be shipped should be spotlessly clean. This is best accomplished by having clean nests. But, if an egg has become soiled and it must be shipped, it should be cleaned with a moist cloth wet in water containing a little soda or vinegar.

In shipping dressed poultry a box is preferable to a barrel or keg. By carefully packing in neat rows on the back, with wings. neck and legs well folded. the product will be very much more readily sold than if it comes out of the package all out of shape. all sorts of sizes, color of skin, etc.

SPECIAL WOMEN'S SESSIONS

Wednesday, March 17

JUDGING A LOAF OF BREAD

Ida S. Harrington

Farmers' Institute Lecturer

In many homes today baker's bread is replacing the home-made loaf. There is seeming economy in it, but it is not real economy when we consider the nutritive, satisfying elements in a well-combined, well-baked loaf of home manufacture. With plenty of wholesome bread, there is less craving for cake and pastry. We may well say that " bread is the staff of life, and bread-and-butter is a gold-headed cane."

In judging a loaf of bread, the following points are to be considered:

1. *Outside appearance, size, and shape* — 10 *points.* It is safe to say that any food is better relished for having an attractive appearance to recommend it. Mouth-watering is a good dyspepsia tablet. It is therefore not too much to allow ten points for the outside appearance.

In the matter of size it has been customary to regard the generous two-pound loaf as the probable prize-winner. But we are being educated away from that, since one of our colleges published its experiments with a loaf of this size. The experiment consisted in using some of the crumb from the center of the loaf, and with it setting a fresh batch of bread without the use of one bit of additional yeast. The dough became as light as though the ordinary methods had been employed. It was convincing evidence that the yeast plants were still " lively " after what had been considered sufficient baking to kill them. It follows that they would be as capable of causing fermentation in the human body as in the fresh batch of bread. Moreover, the heart of the large loaf could not have been sufficiently baked to render the starchy part of the flour digestible.

The best sized pan for the home oven is about seven or eight inches long and five inches wide. A loaf of this size should be baked at least fifty minutes. Each loaf should have a pan by itself. If two loaves are put into the same pan, they need practically the same treatment that one double-sized loaf requires,—that is, more moderate heat longer continued. The shape of the loaf is affected by the temperature of the oven when it is put in, by the evenness or unevenness of the heat, and by the number of pans put into the oven at the same time. If the heat is not great enough, fermentation will continue when baking should have begun, and the loaf will rise to "sky-scraper" proportions and even double back over the edges of the pan. If, on the other hand, the heat is too great, the outside of the loaf may be overdone while the inside remains soggy, or the loaf may crack open. A good test is to hold the hand in the oven. If it can be held there for ten or fifteen seconds, but no longer, the heat is about right. If an oven indicator is used, 375 degrees is a safer temperature than the 400 degrees given as bread temperature on the dial. If the oven is crowded so that there are no air spaces between the pans, the loaves will always be uneven in shape. In case the oven heats unevenly, turn the pan once or twice during the first half-hour.

2. *Crust* — 10 *points.* We have long ceased to believe in the old superstition of our childhood that eating the crusts of the bread would make our hair curly. Nevertheless, the crust is a valuable part of the bread, and should receive more care than it does. Being subjected to greater heat than the rest of the loaf, the starch it contains is thereby made as much more digestible as baked potato is more digestible than boiled. In judging loaves of bread, therefore, a higher score will be given to the loaf with a crust of a golden brown color, than to the loaf with the pale yellow or even whitish crust. If, however, the crust is thick and hard, we judge at once that the loaf was subjected to too high a temperature when it went into the oven. Such a crust forms a thick shell that prevents the heat from reaching the heart of the loaf as it should. The crust of a prize loaf should be golden brown in color, less than one-eighth of an inch thick, and should crumble easily. Whether we prefer it crisp or tender is a matter of personal preference and does not affect the score.

3. *Lightness* — 10 *points.* In general, too much rather than too little stress is laid on having bread light. Flavor and texture are often sacrificed by allowing fermentation to go on too long.

The finished loaf should be very little more than twice as high as when it was put into the tin. The test for the proper degree of lightness is not only in lifting the loaf, but in examining the texture. A loaf may appear light, and still have a heavy streak which would lower the score.

4. *Crumb* — 15 *points.* A loaf of bread should be a day old when judged at a contest. If cut the same day it is made, the most carefully baked crumb may seem unduly moist. The color should be slightly yellowish. Gray flour indicates a poor grade of wheat, poor milling, or a poor quality of gluten. Moisture is best determined by taking a little of the crumb between the thumb and finger and pressing it lightly. If the bread sticks together and fails to rebound after this test, provided it is at least a day old, it is a proof of an underbaked loaf. If it crumbles and shows no elasticity, it is too dry — either from overbaking or from the use of too much sugar.

5. *Grain texture* — 20 *points.* The loaf should be fine in grain and even in texture. A coarse-grained loaf is often caused by allowing it to rise too long after it is put into the pans. An uneven texture, showing bubbles of varying sizes and shapes, suggests that the last kneading has been hurried. This kneading should not be long-continued, but must be sufficient to break up all the large bubbles. Too close a texture suggests the use of too much flour, or insufficient rising.

5. *Odor, taste, flavor* — 30 *points.* Much can be told of the quality of bread by the odor. If there is the slightest suggestion of acidity or yeastiness, the loaf must be scored down. Yeastiness is not due, as is sometimes supposed, to the use of too much yeast. The usual quantity of yeast may be doubled in order to hasten the bread-making process, and, provided that the loaf is thoroughly baked, it will be entirely free from any odor or flavor of yeast. The flavor will, it is true, be much better if the rising process is not too hurried. If, however, fermentation goes on too long, the yeast plant forms products which give a poor taste and odor to the bread. Sometimes these products are not destroyed in baking, and the bread may become stringy. This is caused by poor yeast.

Flavor is also much affected by the quality of flour used. The nutty flavor which is so much desired in bread is caused by ferment bodies not removed from the flour in milling. In unsound flour this becomes so strong as to be unpleasant. To insure a well-flavored bread, therefore, it is wise to test the odor of the flour before using it for baking. Flour which smells only slightly musty may produce a bread which has a decidedly musty odor and flavor. The prize loaf has a clean, sweet, nutty flavor and is seasoned with just enough salt to keep it from tasting flat.

7. *Care of bread after baking — 5 points.* Often a loaf of bread appears at a contest which ought to have the first prize except for the fact that it has not had proper care after baking. If a loaf, before it is entirely cool, is wrapped in a cloth and perhaps in a paper outside the cloth, moisture is sure to collect on it and cause a condition favorable to the development of mustiness and mold. Such a loaf entirely lacks the fine flavor of bread thoroughly cooled on a wire rack, protected from dust by a piece of cheesecloth thrown lightly over it, and stored in a stone crock without any cloth around it, and with no remnants of former bakings in the same crock. In bringing a loaf of bread to a contest, it is best to wrap it first in a sheet of waxed paper and around that put clean wrapping paper (not newspaper) which is free from any odor that might taint the bread.

DISCUSSION

Q. Would you advise using milk in making bread?

A. I should use half milk, as it makes the bread more substantial and nutritious, and gives a browner and more tender crust. Skim milk is as satisfactory as whole milk for this purpose.

Q. Should the milk be scalded?

A. Yes, this will prevent the growth of "weeds," that is, of lactic acid bacteria which would destroy our crop of yeast plants.

Q. Will salt injure yeast?

A. On the contrary, unless used in excessive amounts, it fills the same purpose as do hops or ginger in preventing undesirable fermentation.

Q. Do you recommend the bread mixer?

A. Yes, especially where large quantities must be made. The experienced housekeeper sometimes finds it difficult, in learning to use a bread mixer, to go by exact measurements instead of by the "feel" of the dough, but it will pay her to get used to the change.

Q. Is bread with shortening as healthful as without?

A. Yes, without doubt.

Q. What about using potato in bread?

A. Potato in bread keeps it moist longer, adds nutritive value, and furnishes variety. One cup of mashed potato may be used with four cups of flour.

Q. What foods are good substitutes for meat?

A. First, milk. A quart of milk is equal in food value to ¾ pound of lean beef at 20 cents per pound. Next, eggs when they are cheap. Then the legumes — peas, beans, and lentils, the latter not so well known among Americans as they ought to be. Then dishes containing cheese or nuts.

Q. What constitutes a good school lunch?

A. My first choice — for cold weather at least — would be to start the lunch with some hot liquid like cocoa or soup. My next choice would be milk if it could be kept sweet. Often both these suggestions are impracticable because there is no means of preparing anything at school, and the children dislike the responsibility of bringing home empty bottles.

In preparing sandwiches for the school lunch box, it is well to cut the bread thin and run the meat through the meat grinder, in order that they may not be swallowed half-chewed. Vary the white bread with graham or whole wheat, and the meat filling with cheese, egg, or jelly-and-nut mixtures. Use fruit rather than pastry, and plain cookies or simple cake rather than doughnuts.

Q. Is it desirable to use commercial canning powders?

A. No. It is not necessary if our foods are thoroughly sterilized, and their continued use may be injurious to health, especially to that of children. And at best it is poor economy to pay at the rate of ten cents an ounce for a powder largely composed of boracic acid which may be bought for twenty-five cents a pound.

Q. Is there a safe headache remedy?

A. It is very unsafe to buy a commercial remedy, the effect of which on the heart action you do not know. It is not even safe to have refilled a prescription given you by a physician a year ago, without again consulting him. Your physical condition may have changed entirely in the meantime.

Q. What are some of the rules for good health?

A. First, a proper diet. Three thousand deaths occurred last year in the rural districts of New York which might have been prevented, and eighty per cent of our preventable diseases are due to wrong feeding. We waste fifty per cent of our fruits and vegetables, the use of which would help to free us from the need of taking medicine.

Second, fresh air and sunshine, and pure water.

Third, healthful surroundings. We can greatly help to keep them so by common-sense care in avoiding the scattering of disease germs. Dr. Heaton says, "If every individual in the community habitually covered the mouth when coughing or sneezing, washed the hands thoroughly before eating or preparing food, and abstained from moistening the fingers with saliva, health officers would have little to do in controlling the spread of contagious disease."

Q. What is the first necessity in rural sanitation?

A. A pure water supply in the house. I can not urge the liberal use of water, inside and out, as is essential to health, when I know that the mother has to draw and carry every drop of it, and when I suspect its purity after it has been laboriously drawn and carried.

Q. What is the safest way of disposing of household waste?

A. For rural homes, without question, the septic tank. Circulars giving clear and practical instructions for installing a septic tank may be obtained from the Bureau of Farmers' Institutes.

Q. How do you get rid of cluster flies?

A. Abundance of air and sunlight will help to keep them away. To destroy them if they have gained entrance, use fresh pyrethrum powder to stupefy them, and burn them without loss of time.

Q. What is the best material for winter underwear?

A. Light-weight wool is ideal so long as it retains its quality of absorbing body moisture and admitting air. It loses this quality in shrinking. Therefore it is better to select a mixture of cotton and wool which will give some of the advantages of the wool garment without its disadvantages. A mixture of silk and wool, an ideal combination, is too expensive to be considered by the average buyer.

Q. Are paper towels, paper dishcloths, etc., a good investment?

A. Paper towels are a sanitary protection from the disease germs so easily spread by the old-time roller towel which was used by everyone. Paper towels are also useful for wiping up "spills" on stove or table, they may be used as holders in an emergency, and prove useful in many other ways not thought of until we begin to depend on them. Paper containers are useful for the storing of left-overs. Paper dishcloths are an excellent substitute for the dishcloth which so easily becomes a "dishrag." It takes a little time to become used to the paper dishcloths because they seem stiff and unyielding compared with the more pliable cloth.

Q. Is there a practical dishwashing machine for the private home on the market?

A. The best features in any dishwashing machine may be adopted without buying the machine. They are the wire plate-racks by means of which plates, cups, saucers, etc., may be allowed to dry without wiping, and the wire baskets for holding spoons, knives and forks, in which these may be lowered into the pan of boiling soap-suds, transferred in one motion to the boiling hot rinsing water, and removed in one motion to be dried. The use of these baskets makes it possible to use much hotter water than when we remove the silver from the dishwater piece by piece by hand. And careful scalding of spoons and forks is a safeguard against the spread of grippe, sore throats, etc. Both the wire racks and the baskets may be bought at any good store that handles household utensils.

Q. Can chicken be cooked in a fireless cooker?

A. There is no better method of cooking a fowl. If it is to be left whole, cook it on the regular stove (using the fireless cooker kettle) for thirty or forty minutes, to make sure that the heat has penetrated all through. Then transfer to the fireless cooker. Remember that the heat in the fireless cooker gradually declines, and that it is not safe to leave the chicken shut up in it after the heat has gone down perhaps to body temperature. If the chicken is not so tender as you would like, return it to your kitchen stove and bring it back to boiling point, then it may be returned to the cooker. When done, it should be at once removed and cooled quickly.

SOME THINGS THAT MAKE RURAL HOMES BETTER

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Farmers' Institute Lecturer

If we give to the term "lady" its original unspoiled meaning, then a session on bread-making, such as we have just concluded, may well be described as a typical ladies' session. By its derivation the word lady means loaf-giver or bread-server. The name is also defined as "dispenser of food," "a woman who looks after the domestic affairs of the household," "a woman of gentle manners," and "a woman to whom one is devoted or bound." All these definitions suggest qualities that make the ideal homemaker,— one who glories in her profession. The mental pictures they call up are in startling contract to that suggested by the present-day use of the term "lady."

The fine old name has been spoiled. Having let its meaning first degenerate to the point of describing a woman of leisure — one who had no need to work — we are almost taking it to mean a woman who scorns her work as being beneath her. To my mind the word "lady" or "loaf-giver" recalls always that ideal mother who dispensed to her little flock the loaf which her own hands had fashioned. It recalls the deftness and dignity that glorified the task. It recalls the gracious giving that glorified the simple fare. It recalls the lesson of her life: that in mental and spiritual things, no less than in physical, the "staff of life" is derived from a right use of what is simple and wholesome and without pretense. No material luxury existed in that home but the vision to see riches in the things that are eternal, the power to spiritualize the work of the home.

Each one of us here today has the same opportunity as had she, to ennoble our daily tasks; to lift housekeeping to a plane where it shall cease to be an end in itself and become a means of achieving high ideals of homemaking. You teachers will daily be privileged — through conscious and unconscious tuition — to take your stand for all that is fine and true, and to point the lesson of better work as a means of greater service to others. You mothers of little ones can lay up for them day by day such treasure-stones of memory as will build them a spiritual home that absence can not take away. Whether our housekeeping days are far in the future, or years in the past, there is not one of us but who may be a homemaker in the truest sense, in shedding an atmosphere of home over all the lives that touch our own. For it is not the house that makes a home, but the indwelling spirit of mutual service. As an end in itself, housework may be a "circle of the eternal grind;" as a means to ideal homemaking it opens for us the "path of the eternal glory."

RECREATION IN THE HOME

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We hear a great deal about community spirit in these days, and think of it perhaps as something that depends on organization for its growth. Community spirit is nothing more or less than a joint sense of ownership in the place in which we live. It represents the united effort of a community to develop itself into a home town which shall draw its absent children back to it again and again for that re-creation that helps in making a fresh start, which is the function of every true home. Such a community is a natural union of individual homes of which each one measures up to its opportunities as a center of recreation. Anyone who enters a home of this type is at once conscious of a sense of rest, refreshment and renewal. Sociability is practiced there as a fine art, and that is but another name for social service.

TRUE HOSPITALITY

It is important to think of sociability as a fine art, for the recognition of it as such will help to save it from becoming a lost one. There is danger that the old-time sociability may be displaced by modern "entertaining." If we permit this to happen, our homes may become afflicted with that modern disease, paralysis of the latch-string. There are still many homes where the latch-string, with all its old-time vigor, beckons an invitation to young and old to enter and take the household exactly as they find them. That is hospitality. But there are other houses where the modern idea of competition has been allowed to creep in; where the ability to "entertain" is being constantly compared with that of rival "entertainers"; and where such expressions are heard as, "It is so hard to keep up," "Everybody tries to go everybody else one better," "I suppose I must invite those people to pay off my obligation," "I wonder what they will think of my cooking." That is entertaining, not hospitality, and there is neither recreation nor happiness in it for anyone.

It is a natural impulse, and a right one, to offer our guests the best that we have. It is merely a question of values in deciding what is our best. Is it honoring our guest more to change our manner of living and talking because of his presence, or to admit him to the inner circle of our home life? What is good enough for our friends is not too good for our family. If we keep our best rooms and our best selves open for our own household, we need make no change in customs nor manners for a guest. A man asked the question: "Is it wrong to drink coffee from your saucer if there isn't any company?" And the answer he received was: "If you hesitate to drink from your saucer when there is company, why form a habit that will make you uncomfortable just when you want to be most at your ease, so as to have a good time yourself and give a good time to others?" "Be yourself" is the first rule in the fine art of sociability. To preserve the honest simplicity which is its essence, competition must go. It may be the life of trade, but it is the death of true hospitality. What is it but the instinct of competition that makes a hostess apologize for her food, the appearance of her house, or her own dress? Isn't she mentally comparing them with what she thinks someone else would provide, or with what she imagines that her guests expect? And all the time her guests are probably wishing that she would "take off her mask," forget to be "cumbered with much serving," and give the precious time to real intercourse.

TRUE VIEWPOINTS FOR CHILDREN

We cannot be too careful in cherishing the instincts of hospitality in our children. The greatest power we can put into their hands is a spirit of universal friendliness, a belief in the goodness of people. The successful leader is always the one who believes in the ability and willingness of everyone to help. A girl was arguing with her teacher against doing the share that had been assigned to her in a little entertainment, and thought she had clinched the argument in saying, "But, Miss ——, I just hate to do it!" when her teacher with a confident smile replied, "Yes, I know you hate it; that's why I am so proud of the way you are going to do it!" Being a very modern and slangy young person, the girl exclaimed, "My, but you're foxy!" But she did what was expected of her and did it well.

Another essential in real hospitality is sincerity. Someone has said, "Politeness does not consist in any outside mannerisms, nor is it simply kindness; it consists in treating every person as if she were what she might be instead of what she is." If we carried this a step farther, and said that true friendliness consists in talking of all people as if they were what they might be instead of what they are, we should reach the ideal of never shattering the children's faith in people, nor their faith in our sincerity. In the interests of simple honesty, we should refrain from any injunctions to do this or that, or to leave this or that undone, "because there are going to be guests, and what will they think of you?" We should thus save everyone concerned much embarrassment and discomfort from the childish propensity for "showing off," which comes as a sure result from such injunctions.

Self-consciousness is the bane of sociability, and we plant the seed of self-consciousness when we suggest a line of conduct "because Mrs. So-and-So likes quiet little girls," or ask the question, "Why don't you try to be more like little Mary?" Children are natural mimics, they have strong dramatic instincts, and before we know it we may have encouraged them to assume first one pose and then another, until they find it impossible to be natural. Isn't there something of that same idea of competition in trying to have our children measure up to some imaginary requirement on the part of our guests rather than letting them be simply themselves at their best?

The ideally hospitable welcome carries an unspoken assurance that the guest of one member of a household is the guest and friend of all; and that even the very small child feels it a privilege to contribute its share towards the general pleasure. In such an atmosphere there is no growth of wall-flowers, of hangers-back in the game of life, of social dyspeptics who want their pleasures predigested. There is nothing to threaten the limberness of the latch-string. There is no lack in the ability of such a household to make its own good times, and contribute to the good times of others.

ENTERTAINMENTS WHICH ARE WORTH WHILE

Among the things that threaten to paralyze the social talents by disuse must be classed the vast amount of ready-made entertainment offered us today, from nursery days up to old age. First and foremost come the moving pictures. Not that they deserve wholesale condemnation; everybody must admit their possibilities for good. But those who acquire the moving-picture habit, who sit night after night, being amused with no effort on their own part, soon lose the ability to contribute amusement, while the physical lassitude from strained eyes and starved lungs, brought on by constant attendance at moving picture theatres, makes the slightest exertion a hardship.

A group of girls, all of them addicted to moving pictures, were invited to spend a summer afternoon and evening at a camp on the lake shore near their village. The first suggestion made after the party had reached camp was that everyone go in swimming. All but one or two voted it too much trouble. "It was tiresome to take your clothes off and have to put them on again, and besides that they would feel so silly bobbing up and down in the water; the rest might go, they would just sit and look on." The few performed for the benefit of the many, incidentally getting much pleasure themselves. Whatever was proposed met much the same fate. Finally, after supper under the trees, as the shadows lengthened and woods and water grew more and more beautiful, someone suggested singing. Again one or two agreed, and again the majority demurred. They said that by staying any longer they would be late for the moving pictures, and they were "following up the 'Perils of Pauline'!" It may be argued that even "Pauline" might be used for recreational purposes if her "perils" were amusingly reproduced for the benefit of shut-ins, but the "Pauline" form of entertainment fails to develop any faculty in that direction. It is distinctly "machine-made."

Whether the same thing may be charged against machine-made music of the victrola type depends entirely on the use that is made of it. If the victrola is used, as it should be, as a leader and an instructor, it becomes an inspiration. But if by means of it we do our singing by proxy entirely; if the mother delegates the victrola to tell nursery tales and sing lullabies; then the sooner the victrola is worn out, the better. The child who is raised on mechanical stories and ready-made toys never discovers within itself that wonderful treasure-trove of imagination which transforms the humdrum world into a wonderland. Where the imagination is stunted there is a lack of resourcefulness, a lack of understanding of the feelings of others, an undeveloped sense of humor — in short, an inability to live sociably.

Which child is better equipped for happiness — the one who on a miniature electric stove prepares a meal for her family of over-dressed dolls, or the one who fashions a kitchen and stove from sticks and stones in the woods, and builds a wonderful coal-bin between the spreading roots of some great evergreen? Carefully selected twigs form bars to hold the fir-cone "coals" safely in the bin, and when fresh fuel is needed, the lowest twig is removed and the fuel comes flowing out in a delightfully realistic way that never loses its charm. Whoever has played house in this fashion during childhood, finds herself looking speculatively at possible forest "coal-bins" ever after.

Which child is having the fairer chance for self-development — the one who spins through the country in an automobile, or the one who with two chairs and some string drives an imaginary pony carriage to the station (without ever moving beyond the living-room) to meet an imaginary friend, generously resolving to let the friend drive the pony home because she "can only do it sometimes, and it's my pony so I can do it every day"? Physicians say that if automobile trips are allowed to replace normal play the child's physical welfare will be threatened. It is even more true that the child's social nature will remain undeveloped, and with it the child's ability to do its share of the world's work and play.

A BROAD SOCIABILITY

We must develop the child's social instincts to include "all sorts and conditions," all ages and kinds. Specialization is as much the cry of the day as is competition, and it is as great an enemy to true sociability. Specialists are notably poor company because of their inclination to talk shop. And so the two school girls who are all-in-all to each other, the housewives who confine their intercourse to the discussion of household perplexities, the man and the maid who are absorbed in their especial kind of "two-by-twoness,"— all are missing something by not broadening their interests. Far be it from me to belittle the good and laudable two-by-twoness that belongs by right to every man and maid. But there would be fewer mistakes and fewer regrets if they built their specialized sociability on a foundation of broader acquaintance. They deprive themselves of the chance to know how very many other nice people there are in the world, and they deprive the world of the chance to find out how nice they are. If any of us build walls around our particular fields of interest, intercourse with people in other fields will be hampered by those walls. In the interests of true sociability the walls must come down.

Much of our recreation comes through readjustment, though having our rough corners knocked off in free intercourse and wholesome play with those older and younger than ourselves, as well as with those of our own age and interests. This kind of recreation does not come at public entertainment — it comes in a true home. It comes through constant practice in putting ourselves in the place of others. The father and mother who become "as little children" in a whole-hearted willingness to join in childish games, who extend their fellowship to their children's friends, who never erect walls of reserve; the children who show as true a hospitality to older people as to their own intimates, who share work and play alike as joint owners of the home — such a household stands in the community for sociability as a fine art, and fosters true community spirit in all who come within its influence.

THE POWER OF SONG

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Farmers' Institute Lecturer

Whoever pauses amid the turmoil of daily duties to weigh true values, must realize that there is no builder of character so noble, no creator of memories so enduring, as the heritage of song. A true heart song, composed of words and melody that are coined from the heart's pure gold, becomes a priceless legacy that lifts us above earthly things. Our lives are but memories in the making. What family is there, then, that can afford to build its future memories on songs that are not worthy to live?

The most effective influence for good in songs is the influence of the home, and it rests with the individual members of each household to raise the standard of our home songs to a plane where our memories will gladly linger in years to come.

The fear of being called "old-fashioned" has made fathers and mothers — yes, and grandfathers and grandmothers — hesitate to protest against the use of songs that bring filth into the minds of our boys and girls. The fear of not being "up-to-date" restrains the girl and boy, when instinct — as yet undulled — prompts them to take their stand against the use of the typical "best seller." Have the parents who so dread being thought of as "old fogies" ever asked themselves the question, "Shall I be happy to have my children remember their home by this song?"

I am sometimes asked, "How can we tell whether a song is fit to sing? Is all rag-time bad?" Rag-time in itself is not bad, may be even rather pretty with its sprightly rhythm, but it is put to bad uses in supporting words that would render the author liable to arrest were he to speak or read them aloud without the rag-time cloak. Test a song by reading the words apart from the tune. Will they bear reading aloud, or do they suggest a type of book which we should rightly be ashamed to be found reading? Nor is it enough that a song should be merely not bad. We are careful not to clutter our homes with useless things; how much more should we guard against filling our minds with songs that have no value, and take up the room that might be crowded full of good songs without exhausting the supply?

Not all the old songs were good, any more than all the new songs are bad. The old songs that were unworthy have been forgotten. Those that survive are the more precious for having passed the test of time. Many of our modern songs will do the same, will be as perfect a mode of self-expression in centuries to come as are some of our century-old songs today.

A test to be applied to every song is, "What does it mean to me?" I have been asked, "What do you consider the best hymn?" This is a question that no one can answer for another. One hymn may meet the heart-needs of one person and not those of another. Our varying life experiences make us respond to varying appeals. Each one of you will answer the question best for yourself as you recall your own favorites. One says, "Guide Me, O Thou Great Jehovah," and it brings up the memory of dear ones who found their strength in these same lines, and makes me feel that I know somewhat of the life of her who has just cited the hymn as her favorite. Another says, "Lead, Kindly Light," another, "In the Cross of Christ I Glory," another, "Nearer, My God, to Thee." Probably no hymn that ever was written makes so strong an appeal to so many people as does the last named. It as truly expresses our individual aspirations as if Sarah Flower Adams had been writing of us.

Need I emphasize the contrast between such hymns as we have been discussing, and the type mentioned by someone as we came into the hall, of which a member of the Sunday school was quoted as saying, "I must learn that new Sunday school hymn right away; it makes such a splendid fox-trot!"

Surely no stronger argument is needed to prove that we need better hymns for the church and Sunday school, better songs for the rural school and grange, and, most of all, better songs for the home, than are found on the average organ and piano.

I know you women of Albion are ready to head the movement by going through the words of all the songs that are sung in your home, and keeping only those of which you can truthfully say, "These are worthy to stand for my home and to make my home traditions and my children's home memories!"

Q. Can you give me the name of a good denominational song book?

A. In a broad sense, yes. The Community Hymn Book, published by the Oliver Ditson Company, is suited to all denominations.

Q. Are there any popular hymns?

A. Yes, there are popular hymns,— those that last. I think "Nearer, My God, to Thee" is a popular hymn, and there are many others which you all know. Do you not think that the young people will be kept in the church by singing the so-called popular hymns of the "tinkle, tinkle, tinkle" variety. They soon learn the value of the grand old hymns. Teach these to the young people and they will have more respect for the church and the Sunday school than if given the other kind.

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STATE OF NEW YORK

DEPARTMENT OF AGRICULTURE

CHARLES S. WILSON, Commissioner

Bulletin 75

What Shall the Farmer Read?

BY
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WHAT SHALL THE FARMER READ?

Millet, in his "Man with the Hoe," has painted a farmer who does not read; and Markham in his poem has voiced the condition of this same luckless creature. He stands before us in both picture and poem, a thing little better than the beasts — a mere machine to whom Nature's "sermons in stones, books in running brooks and good in everything" do not appeal, and from whom have gone, if ever he possessed them, both desire and ability to gather instruction, uplift or pleasure from the stored thoughts of other minds. By some this forlorn peasant has been thought a fitting type of the farmer of today. Even Hawthorne tells us: "The yeoman and the scholar, the tiller of the soil possessing the sturdiest sense, integrity and honor, and the man of the finest intellectual culture are, and must remain, two distinct beings."

But we hold that Millet's painting and Markham's poem typify exceptional conditions. There may still be somewhere in small numbers farm laborers, or even farm owners, whose thoughts do not rise high above soil and stable, and whose lives of daily toil and routine, without books or other stimulating influences, have made them mere living attachments of the plow; but this is not true of the modern American husbandman. He is a thinker, a student of his own problems, an interested observer of the world's life, a dependable and helpful citizen when need calls, and often a man of culture as true and deep as that of the dweller in cities. Farm life need never deaden the finer sensibilities nor check high aspirations, even for literary expression. Virgil, the great Latin poet, was a farmer; Burns at the plowtail composed those songs that still stir the hearts of men; Whittier in the hayfield was moved to thoughts whose expression heralded freedom for the slave; Thoreau in his little bean patch conceived nature pictures that please; Webster, Lincoln, Garfield, in their humble farm homes, found time to cultivate the taste for books which all their hard farm labor could not quench.

THE FARMER MUST READ

The American farmer of these opening years of the twentieth century is not an illiterate, uncultured boor. He cannot be and succeed. He meets life at too many points where knowledge gained from wider experience than his own must come to his aid. The old distrust of "book farming" is rapidly passing; and the progressive herdsman or gardener or orchardist finds practical guidance in books dealing with the technical side of his craft. With all humanity, he may reason with the philosopher, laugh with the humorist, thrill at the vivid pictures of the novelist, smile or sigh with the poet or feel his aspirations mounting high under the spell of the preacher's words, as the thoughts of some of these intellectual masters became his own through the lines of the printed page. So we might dismiss the question, "What shall the farmer read?" by saying that he should, and can, and does, and will, read and understand and appreciate any book which is worthy the thought of other men. But the mass of published literature is great, and the farmer, by his comparative isolation, is separated from librarians, critics, teachers and others who have greater leisure than he to read, compare and select books; so he frequently reads much without value, merely because he does not know of that which is better, or, appalled by the mass of books, fails to read any. This last is a fatal error: for he who fails to read good books misses a part of life nothing else can replace. This is particularly true of those whose lives must be spent on farms; for by their separation from their fellows they can less easily avail themselves of other means of culture whereby the dweller in cities, though not a reader, may to some extent secure the mental training given to him who reads thoughtfully the best books.

BOOKS NECESSARY FOR CHILDREN

The children of the farm home need books. Beecher says: "No man has a right to bring up his children without surrounding them with books. It is a wrong to his family. He cheats them. Children learn to read by being in the presence of books. The love of knowledge comes with reading and grows upon it, and the love of knowledge in a young mind is almost a warrant against the inferior excitement of passions and vices. A little library, growing larger every year, is an honorable part of a young man's history. It is a man's duty to have books. A library is not a luxury, but one of the necessities of life." Were more country homes supplied with interesting reading, there would be less occasion to raise the question, "How shall we keep the boys on the farm?" Even one good magazine or paper like *St. Nicholas* or *Youth's Companion* coming regularly into the house will be a tie most boys will consider before leaving the home nest to "become pirates," "hunt grizzlies" or "kill Indians." These juveniles of better class will establish the children's tastes and prevent their finding supreme enjoyment in cheap, flashy literature which has to be read secretly, out behind the barn or in their rooms with doors closed and lights low. These should be followed by more solid magazines, studying the child's taste, if necessary, to lead him on; but he will usually soon take up the periodicals in which he sees his parents interested and from them will pass quickly and easily to the best and solidest books.

The occasional arrival as a birthday or Christmas gift of a new book like Thompson-Seton's *Wild Animals I have Known,* Bailey's *Lessons with Plants,* Gibson's *Sharp Eyes,* Blanchan's *Bird Neighbors* or others of the nature study class will waken the wits of boys or girls, if they have any, and inspire a love for country life that it will take many city attractions to overcome. A good story by Castlemon or Alger or Henty, while not of great literary merit, will teach good morals and develop respect for courage and honor. They can do the sensible boy no harm, and their charm will fill him with disgust for the low pleasures of the corner grocery, billiard room or saloon. The *Man from Glengarry* cannot help but appeal with power to the manly qualities of any country youth.

BOOKS AID FARM PRACTICE

The farmer needs books which treat of the farm. The days have long since passed when he could turn over the fertile soil and, weather permitting, reap a bountiful crop without opposition from insects or disease. He can no longer send his cattle into the rich meadows or hill pastures, toss them a generous supply of easily raised corn and corn-stalks at stabling time and make a profit on the resulting milk and beef. Soils have lessened in fertility, enemies have come to grain and fruit, competition forbids wastefulness of every kind if cultivation and feeding are to bring profits. In the old days, a good vigorous body employed in faithful work along well-known broad lines was all that was needed to earn Nature's bounty; and the near field supplied the near market. Now, the farmer who depends on strength alone and treads the path his father trod must go to the wall. To succeed, he must know the principles which underlie soil fertility, he must be on the alert to meet the enemies of his crops, he must make each of his animals do the best possible on a minimum expenditure for food, he must make his profit fit to compete with the best in the world, he must market right, he must buy right.

To keep posted along these lines, books and papers are essential. Fortunately, the past few years have given us a vast fund of interesting and valuable literature in the realms of scientific and practical agriculture and horticulture. The work of the experiment stations and the U. S. Department of Agriculture has given a basis of scientifically proven facts upon which to base discussions of farm problems, and the intimate studies of investigators have made them familiar with the most successful farm practices the world over; so that the recent books along agricultural lines are both accurate and interesting. The few good old standbys of twenty years ago, like Allen's *Book of the Farm,* Sheldon's *Dairy Farming,* Henderson's *Gardening for Profit,* Stewart's *Feeding Animals,* Greeley's *What I Know About Farming* and others of their type were most helpful and inspiring in their day, and each contains the best of a vast body of truth discovered by practical cultivators and feeders. These books should not be sneered at or passed over in silence; but they have been superseded, for the progressive farmer, by the works of Roberts, Bailey, Jordan, Voorhees, Brooks, Henry and others who emphasize principles without neglecting practices. The titles of many of these books will be found in the appended list. (For presentation to audiences these lists might well be made in the form of charts.)

The thoughtful farmer will not neglect to secure and use a file of station bulletins; for if he does he will miss many points by which his neighbor will profit. You should preserve complete files of the bulletins of your own stations — the State Station at Geneva and the Cornell University Station at Ithaca. These cost you nothing and require only small storage room: and when they are applicable to your conditions their guidance is valuable, for it rests on conscientious, careful work of trained investigators. When your favorite farm paper mentions a bulletin of interest from some other station, write a courteous request for it to the director of that station. You will be almost certain to get it if the edition is not exhausted; and very few stations make any charge for their bulletins even to those not in the state.

The monthly bulletins issued by the State Department of Agriculture, are devoted to matters of especial interest to New York State farmers, and should form a part of every farm library. These publications may also be obtained free of charge on application to the Department of Agriculture, Albany.

Also, you should keep track of the publications of the U. S. Department of Agriculture. Its work of late years has, as a whole, been careful, thorough and often of great value, although a few of the theories announced have not been accepted by other scientists, or the methods recommended given in practice the results hoped for. The department will, if you request it, send each month a list of publications issued in that month, with a brief indication of their character. Many of these publications, especially the farmers' bulletins and the yearbooks, are free, and the others cost but a few cents apiece. Your congressman or senator can usually secure these for you without expense.

You must, of course, have a good farm paper or two; for these are now most valuable aids to the farmer, not only in raising his products, but in guiding him when they are ready for market. So many good papers are published, even in New York State alone, that you can hardly fail to secure a valuable adviser, whatever one you choose. *Rural Life, Rural New Yorker, American Agriculturist, New York Tribune Farmer,* each is good in its chosen field and style; while from outside the state come *Country Gentleman, Breeders' Gazette, National Stockman, Hoard's Dairyman, Farm Journal, Agricultural Epitomist, Homestead, Wallace's Farmer, Farm and Fireside* and a host of others of greater or less value and applicability. The choice, if you are not already well supplied, should be made with care, after sending for sample copies and studying them thoughtfully to see which of them best meet your needs.

FARMER SHOULD READ FOR GENERAL INFORMATION

Books for children, then, and practical guides to thorough understanding of the farm and its operation are absolutely essential, but the library should contain more than these. The farmer of today, with milk to carry to creamery, cheese factory or shipping station in the morning, and herd to look after in the evening, with feed and fertilizers to haul from market, with poisons and preventives for bugs and blights to mix and apply, with grange meeting of farmers' club to attend, may not have the leisure his father had forty years ago. He fed his horses in the morning, plowed with them until the sun was low, gave them their corn or oats and counted his day's work done; but when you have crowded into the hours between sunrise and sunset their allotted share of the multitudinous details of modern farm activity, you will still have some time to read. Winter evenings are long and Sunday afternoons are quiet. What, then, should you have in your library? Tastes differ; and some of the books that appeal to me might weary many of you with scientific terminology and uninteresting researches, while others that serve as my relaxation to some of you might seem too light and frivolous for serious consideration. Yet there are some books or some classes of books that can be recommended for all, some neglected, some rejected. The human heart beats at about the same rate on the farm as in the city; the mind of the reasoning man, wherever he may be, responds to about the same appeals; hopes and fears, sentiment and sentimentality, pain and passion, as expressed on the printed page by some master hand, will stir corresponding emotions in the breast of the reader, whether he be seated beside the fire in the farm kitchen or reclined at ease in a luxurious city study.

First, it appears to me, the farmer and his family should read the Bible. Even if you cannot subscribe to all its teachings — or to what your may have learned to think it teaches, from interpretations put upon it by others — you can not afford to neglect its pages. You will find between its covers the best guide to morality the world knows; history that has influenced civilization as that told in no other volume; biography for warning, for example, for inspiration poetry as beautiful, as majestic, as heart-thrilling as any in the world's literature; all expressed in "pure English, undefiled," a model of correctness and strength.

Next, the library should be started with a well-known book — one appearing in many editions, revised and corrected, abridged and expanded by many authors — a book of short stories, some thrilling, some prosy, but all true, suggestive and helpful — the dictionary of the English language. Without this book in some good form and its companions, the atlas and encyclopedia, constantly at hand and consulted faithfully, you may miss the best, and certainly will miss something, of the other books you read.

You will require a good newspaper, but you must learn to read it properly, to discriminate without waste of time between gossip to be skipped, sensationalism to be discounted, and topics of local or world-wide interest to be studied with all the earnestness you possess. The magazines also demand a place in every library and every home. Through them we get the best thoughts of living thinkers in every line of human activity; in them we see through the eye of witnesses events that are shaping history, they offer us the best stories from the brightest pens, and they reproduce for us, by the engraver's art, the distant scenes we may not visit, the magnificent conceptions of the great masters in art and the pictured thought of novelist or poet.

BOOKS FOR CULTURE

This is literature for information; you must also read for general culture. Read works which broaden your horizon, deepen your intelligence, arouse in you more sincere interest in society and politics, quicken your sympathies, cultivate your artistic tastes, develop your moral fiber.

History is to most of us only a school study; for we find time to get little beyond a general knowledge of the events that have marked the advance of civilization. Our studies have probably given us only a sketch of the nations of antiquity, a little broader acquaintance, perhaps, with the literature and art of Greece, with the principles of warfare and lawmaking of the Romans, a hasty glance at the Middle Ages, Chivalry and the Crusades, a little keener scrutiny of England's development, since this bears so closely on our own, and probably a fair idea of men, events and principles marking the rise of our own glorious Republic to the foremost place among the nations of the world. Based on this broad foundation, which each should have or should exert himself to secure, we can never read too widely in history. As we become more and more familiar with the interplay of forces, note the principles and practices which have uplifted or cast down leaders and kingdoms, see how some obscure man or some apparently trivial event has changed the course of nations, we not only become broader ourselves, but we realize more clearly how thoroughly interwoven are the interests of the individual with the interests of humanity. Among the writers of histories, the names of Gibbon, Greene, Macauley, Hume, Grote, Motley, Bancroft, Fisk, Lodge, Milton stand prominent, but to select the particular ones for a library is a question of individual judgment and well-considered study. Here, as in the other departments of literature for culture, you may well avail yourself of the friendly counsel of your pastor, school superintendent and teachers, the librarian of the nearest city library or some other friend whose time has allowed more leisure for study of books than has your own.

Most intimately connected with history is biography; for the life and progress of a nation can often be told in the lives of a few of its leaders in thought and action. Such lives have more of personal interest than the pages of history, and we find in the perusal of their record that which instructs and inspires us. No American can be his best until he has read and made part of his life the biographies of Washington, Ethan Allen, Benjamin Franklin, Lincoln, Greeley, Webster, Garfield and their noted compatriots.

Yet history and biography do not show us the heart of the world. They are too formal, we might almost say too philosophical, to picture the real life with its events which move from day to day rather than from age to age, or even year to year. To feel the incidents of human life we must read the literature of the drama or the novel, whose characters move, love, hate, plot, prosper, fail or die in our minds almost as truly as though they were our companions. From the pages of *Ivanhoe* we get more vivid ideas of the life and manners and conditions of that age than from the pages of Macaulay. In Shakespeare's *Caesar* we see a more real conqueror, feel more deeply the power of his mind, realize better the vastness of his triumphs, understand more clearly the fear and envy he aroused, learn more of the motives which moved the Roman mind than we could from any formal relation of his deeds and experiences. In *Hugh Wynne* or *Janice Meredith* or the *Seats of the Mighty,* clearer pictures of our country's early conflicts are fixed upon our minds than come to us from the pages of Bancroft or Ridpath. Mrs. Stowe's *Uncle Tom's Cabin* showed the north the wrongs of the negro as would no calm discussion of the ethics of slavery. *The Jungle* undoubtedly assisted materially in promoting reform in slaughter-house conditions.

In thus supplementing history, fiction and the drama do not exhaust their value. This is greatest in their influence on the spirit and character of the reader. He must be a better man who has known *John Halifax,* a more courteous gentleman, he who has admired *Colonel Carter;* he will become less fretful under petty cares who recalls *Mark Tapley's* merry laugh or *Colonel Seller's* optimism; he will less easily succumb to difficulties who has followed the career of *Peter Sterling.* That woman will have a broader and purer mind, a sweeter spirit, more of sympathy, less of harshness, who has lived mentally with *Agnes Copperfield,* George Eliot's *Dinah, Jeanie Deans, Babbie, Meh Lady, Janice Meredith* or *Diana Mallory.*

As fiction makes familiar to us scenes from other times, makes real to us characters of robust worth, makes to live for us and in us sentiments of which our real lives may be bare, so poetry trains the imagination that it may clothe with beauty the humblest scene. *The Cotter's Saturday Night* has changed the thatched roof of many a lowly cottage to a thin division between the heaven above and its earthly counterpart — a loving, contented home. It has been said and truly, that "A single poem that warms the affections, elevates the soul, excites the imagination, kindles the emotions and arouses noble aspirations, may be worth more to myriads of readers than a whole library of fact, argument, exhortation or edification."

SUMMARY

For your library, then, you should select at least a few good books, among the thousands, in each of the classes I have named. The Bible with a good concordance and Bible dictionary and a few of the best, most uplifting religious books — do not depend on Baxter's *Saints Rest,* Bunyan's *Pilgrim's Progress,* Young's *Night Thoughts* and a few other old standbys probably inherited from your good old grandmother — dictionary, encyclopedia and atlas, a few of the modern, thought-compelling works on the farm and farming, bulletins, a good agricultural paper, a newspaper or two, a story paper, books of nature and an occasional romantic tale for the boys and girls, magazines, history, biography, travels, social science, Shakespeare, some of the best novels and your favorite poets. With such a collection you have started a library no one need be ashamed of and one which will furnish aid and inspiration for all the household. Read them, think of them, add to them, and with the coming years you will find in them satisfaction far outweighing any sacrifice you may have made to secure them.

GOOD BOOKS FOR A FARM LIBRARY

In preparing this list it has been the endeavor to include one or more books upon each topic of special interest upon the farm or in the rural home. While intended to be comprehensive, it can only include one book here and there among the thousands published along these lines; and while care has been used in making the selection, it is not impossible that better books have been omitted than are included. It is believed, however, that no book has been listed that will not be helpful to its reader and well worth its price if properly used. In most cases, the publisher and place of publication are given, but practically all of them can be secured through the publishers of farm papers, like the *Orange Judd Co.*, New York; *Doubleday, Page & Co.*, New York; *The Rural Publishing Co.*, New York; *The Macmillan Co.*, New York; *the Tri-States Publishing Co.*, Port Jervis; *Webb Publishing Co.*, St. Paul, Minn.; *Sanders Publishing Co.*, Chicago, Ill.; and others.

Agriculture

(The general subject.)

Cyclopedia of American Agriculture. Edited by L. H. Bailey. New York: Macmillan. 4 vols.	$20.00
Farmer's Cyclopedia of Agriculture. Wilcox and Smith. New York: Orange Judd Co.	$3.50
Agriculture. Brooks. Springfield, Mass.: King-Richardson Co. 3 vols.	$3.50
Farm and Garden Rule Book. Bailey. New York: Macmillan.	$2.00

Farmers of Forty Centuries. King. Madison, Wis.: Mrs. F. H. King.	$2.50
Roman Farm Management. A Virginia Farmer. New York, etc.: Macmillan.	$2.00
The Farmstead. Roberts. New York: Macmillan.	$1.25
How to Chose a Farm. Hunt. New York: Macmillan.	$1.75
Practical Farming. Massey. New York: Orange Judd Co.	$1.50
Manual of Practical Farming. McLennan. New York: Macmillan.	$1.50
Practical Agriculture. Wilkinson. New York, etc.: American Book Co.	$1.00
The New Agriculture. Wallace. Philadelphia: Lippincott.	$1.25
Dry Farming. Widtsoe. New York: Macmillan	$1.50
Dry Farming: Its Principles and Practice. MacDonald. New York: Century Co.	$1.30
The Farmer of To-morrow. Anderson. New York, etc.: Macmillan.	$1.50
The Training of Farmers. Bailey. New York: Century Co.	$1.05

(Text Books in Agriculture.)

Principles of Agriculture. Bailey. New York: Macmillan.	$1.25
First Principles of Agriculture. Voorhees. Boston: Silver, Burdette & Co.	$1.00
First Principles of Agriculture. Mills and Shaw. Toronto, Canada: Bryant Publishing Co.	$0.40
First Book of Farming. Goodrich. New York: Doubleday.	$1.10
Fundamentals of Agriculture. Halligan. Boston: Ginn & Co.	
Elements of Agriculture. Warren. New York: Macmillan.	$1.10
Beginnings in Agriculture. Mann. New York, etc: Macmillan.	$0.75
Agriculture for Beginners (revised). Burkett, Stevens and Hill. Boston: Ginn & Co.	$0.75
First Principles of Agriculture. Goff and Mayne. New York, etc.: American Book Co.	$0.80

High School Agriculture. Mayne & Hatch. New York, etc.: American Book Company. $1.00

Sixty Lessons in Agriculture. Buffum & Deaver. New York, etc.: American Book Company. $0.60

Agricultural Chemistry

Agriculture in Some of Its Relations with Chemistry. Storer. New York: Orange Judd Co. 3 vols. $5.00

How Crops Grow. Johnson. New York: Orange Judd Co. $1.50

How Crops Feed. Johnson. New York: Orange Judd Co. $1.50

Soil Fertility and Permanent Agriculture. Hopkins. Boston: Ginn & Co. . $2.50

Chemistry of Soils and Fertilizers. Snyder. Easton, Pa.: Chemical Publishing Co. $1.50

Chemistry of Plant and Animal Life. Snyder. New York: Macmillan. $1.50

Chemistry of the Farm. Warington. New York: Orange Judd Co. $1.75

Practical Farm Chemistry. Greiner. New York: Rural Pub. Co. $1.00

Organic Compounds of Every-Day Life. Willard. Manhattan, Kans.: Author.

Chemistry of the Garden. Cousins. New York: Macmillan. $0.35

(See also Section "Foods" under "Domestic Economy.")

Meteorology

Talks About the Weather. Barnard. New York: Funk & Wagnalls. $0.75

Elementary Meteorology. Waldo. New York: Scribner. $1.25

Story of the Atmosphere. Archibald. New York: Appleton. $0.40

Agricultural Botany

Plant Breeding. Bailey. New York: Macmillan. $1.25

Agricultural Botany. Percival. London: Duckworth & Co. $2.00

Plant Physiology. Duggar. New York: Macmillan Co. $1.60

Vegetable Physiology. Green. Philadelphia: Blakiston. $3.00

Life of the Plant. Timiriazeff. New York, etc.: Longmans, Green, & Co.	$2.50
Plant Life and Plant Uses. Coulter. New York, etc.: American Book Company.	$1.20
Book of Useful Plants. Rogers. Garden City, N. Y.: Doubleday, Page & Co.	$1.21
How to Know the Wild Flowers. Dana. New York: Macmillan.	$1.75
Flower Guide. Reed. Worcester, Mass.: Author.	$1.00
Plant Relations. Coulter. New York: Appleton.	$1.50
Familiar Flowers of Field and Garden. Mathews. New York: Appleton.	$1.75

Bacteriology

Microbiology. Marshall. Philadelphia: Blakiston.	$2.50
Agricultural Bacteriology. Conn. Philadelphia: Blakiston.	$2.00
Agricultural Bacteriology. Russell & Hastings. Madison, Wis.: Authors.	
Household Bacteriology. Buchanan. New York, etc.: Macmillan.	$2.25
Bacteria, Yeasts and Molds in the Home. Conn. Boston: Ginn & Co.	$1.00
Experimental Dairy Bacteriology. Russell & Hastings. Boston: Ginn & Co.	$1.00
Practical Dairy Bacteriology. Conn. New York: Orange Judd Co.	$1.25
Bacteria in Relation to Country Life. Lipman. New York: Macmillan.	$1.50

Agricultural Zoology

Economic Zoology. Osborn. New York: Macmillan.	
Agricultural Zoology. Ritzema-Bos, translated by Davis. London. Can be obtained through G. E. Stechert, New York.	
Natural History of the Farm. Needham. Ithaca, N. Y.: Comstock Pub. Co.	$1.50
Handbook of Nature-Study. Comstock. Ithaca, N. Y.: Comstock Pub. Co.	$3.65
Nature Study and Life. Hodge. Boston: Ginn & Co.	$1.50

How to Rid Buildings and Farms of Rats, etc. "Pickett." New York: Rural Pub. Co.

Animal Competitors. Ingersoll. New York: Sturgis & Walton. $1.00

Life of Animals. Ingersoll. New York: Macmillan. $2.00

Wild Animals I Have Known. Thompson-Seton. New York: Scribner. $2.00

Sharp Eyes. Gibson. New York: Harper. $2.50

Birds of New York. Eaton. Albany. New York State Museum.

Bird Life. Chapman. New York: Appleton. $1.75–$3.75

The Bird Book. Reed. Garden City, N. Y.: Doubleday, Page & Co. $3.00

Bird Note Books, No. 1 and No. 2. Comstock. Ithaca, N. Y.: Comstock Pub. Co. $0.30

Propagation of Wild Birds. Job. Garden City, N. Y.: Doubleday, Page & Co. $2.00

Field Zoology. Insects and Their Near Relatives and Birds. Crary. Philadelphia: Blakiston. $1.25

Useful Birds and Their Protection. Forbush. Boston: Mass. State Board Agriculture. $1.10

Birds in Their Relation to Man. Weed & Dearborn. Philadelphia: Lippincott.

How Birds Affect the Farm and Garden. Merriam. New York: Forest & Stream. $0.50

How to Attract Birds. Blanchan. New York: Doubleday, Page & Co. $1.49

Methods of Attracting Birds. Trafton. Boston: Audubon Society.

Geology

The Physical Geography of New York State. Tarr. New York: Macmillan.

First Book in Geology. N. S. Shaler. New York: D. C. Heath & Co. $1.10

Soils

Soils. Fletcher. New York: Doubleday. $2.20

The Soil. Hall. New York: E. P. Dutton. $1.50

The Soil. King. New York: Macmillan. $1.50

Soil Management. King. New York: Orange Judd Co. $1.50

Soils and Crops. Hunt and Burkett. New York: Orange Judd Co.	$1.50
Soils and Soil Fertility. Whitson. St. Paul, Minn.: Webb Pub. Co.	$1.25
Crops and Methods for Soil Improvement. Agee. (See Field Crops.)	
Soil Conditions and Plant Growth. Russell. New York, etc.: Longmans, Greene, & Co.	$1.50
Principles of Soil Management. Lyon & Fippin. New York: Macmillan.	$1.75
Physics of Agriculture. King. Madison, Wis.: Author.	
Vegetable Mould and Earthworms. Darwin. New York: Appleton.	$1.50
Chemistry of Soils and Fertilizers. Snyder. (See under Agricultural Chemistry.)	
Fertility of the Land. Roberts. New York: Macmillan.	$1.25
Soils. Hilgard. New York: Macmillan.	$4.00
First Principles of Soil Fertility. Vivian. New York: Orange Judd Co.	$1.00
The Story of the Soil. Hopkins. Boston: Badger.	$1.50

Drainage and Irrigation

Irrigation and Drainage. King. New York: Macmillan.	$1.50
Irrigation Farming. Wilcox. New York: Orange Judd Co.	$1.50
Drainage for Profit and Health. Waring. New York: Orange Judd Co.	$1.00
Tile Drainage. Chamberlain. New York: Orange Judd Co.	$0.35
Practical Farm Drainage. Elliott. New York: Wiley.	$1.40
Irrigation for Farm, Garden and Orchard. Stewart. New York: Orange Judd Co.	$1.00
Practical Irrigation and Pumping. Fleming. New York, etc.: Wiley.	$2.00

Fertilizers

Feeding of Crops and Stock. Hall. New York: Dutton & Co.	$1.50
Fertilizers and Crops. Van Slyke. New York: Orange Judd Co.	$2.50

Fertilizers. Voorhees. New York: Macmillan. $1.00

Manures and Fertilizers. Wheeler. New York, etc.: Macmillan. $1.60

Farm Manures. Thorne. New York: Orange Judd Co. $1.50

Manures and Manuring. Aikman. New York: Van Nostrand. $2.50

Manures: How to Make and How to Use Them. Sempers. Philadelphia: Burpee. $1.25

Fertilizers. Gregory. New York: Orange Judd Co. $0.40

Fertility of the Land. Roberts. (See under Soils.)

Chemicals and Clover. Collingwood. New York: Rural Pub. Co. $0.25

Fertilizer Farming. Collingwood. New York: Rural Pub. Co.

Field Crops

Principles of Plant Culture. Goff. Madison, Wis.: Author. $1.10

Farm Crops. Burkett. New York: Orange Judd Co. $1.50

Field Crops. Wilson. St. Paul, Minn.: Webb Pub. Co. $1.50

Field Crop Production. Livingston. New York, etc.: Macmillan. $1.40

Crops and Methods for Soil Improvement. Agee. New York, etc.: Macmillan. $1.25

International Library of Technology. Vol. 121.

Field and Root Crops. Tobacco and Soiling Crops. Scranton, Pa.: International Text Book Co.

The Book of Alfalfa. Coburn. New York: Orange Judd Co. $2.00

(Condensed book by same author and publisher, $0.50.)

Alfalfa Farming in America. Wing. Chicago: Sanders Publishing Co. $2.00

Broom Corn and Brooms. Compiled. New York: Orange Judd Co. $0.50

The Cereals in America. Hunt. New York: Orange Judd Co. $1.75

Clovers and How to Grow Them. Shaw. New York: Orange Judd Co. $1.00

Corn Plants. Sargent. Boston & New York: Houghton, Mufflin & Co.	$1.00
The Book of Corn. Myrick, *et al.* New York: Orange Judd Co.	$1.50
Indian Corn Culture. Plumb. Chicago: J. H. Sanders Pub. Co.	$1.00
Study of Corn. Shoesmith. New York: Orange Judd Co.	$0.50
Corn. Bowman. St. Paul, Minn.: Webb Pub. Co.	$2.00
Corn Crops. Montgomery. New York, etc.: Macmillan.	$1.60
Soiling, Ensilage and Stable Construction. Peer. New York: Orange Judd Co.	$1.00
Soiling, Ensilage and Silos. Miles. New York: Orange Judd Co.	$0.50
Soiling Crops and the Silo. Shaw. New York: Orange Judd Co.	$1.50
A Book on Silage. Woll. Chicago: Rand, McNally & Co.	$1.00
Modern Silage Methods. Compiled. Salem, O.: Silver Manufacturing Co.	
Silos: Construction and Service. King. St. Paul, Minn.: Webb Pub. Co.	$0.50
Forage Plants and Their Culture. Piper. New York, etc.: Macmillan.	$1.75
Forage Crops Other Than Grasses. Shaw. New York: Orange Judd Co.	$1.00
Forage Crops. Voorhees. New York: Macmillan.	$1.50
Forage and Fiber Crops in America. Hunt. New York: Orange Judd Co.	$1.75
Text Book of Grasses. Hitchcock. New York, etc.: Macmillan.	$1.50
Farm Grasses of the United States. Spillman. New York: Orange Judd Co.	$1.00
Ginsing. Kains. New York: Orange Judd Co.	$0.50
The Hop. Myrick. New York: Orange Judd Co.	$1.50
The Potato. Fraser. New York: Orange Judd Co.	$0.75
The New Potato Culture. Carman. New York: Rural Pub. Co.	$1.00
The Potato. Grubb. Garden City, N. Y.: Doubleday, Page & Co.	$1.21

Tobacco Leaf. Killebrew and Myrick. New York: Orange Judd Co. $2.00

Tobacco. Ragland. Hyco, Va.: Author.

The Book of Wheat. Dondlinger. New York: Orange Judd Co. $2.00

Wheat Culture. Curtis. New York: Orange Judd Co. $0.50

Farm-Garden and Vegetable Crops

Horticulturists' Rule Book. Bailey. New York: Macmillan. $0.75

The Gardening Blue Book. Holland. Garden City, N. Y.: Doubleday, Page & Co. $3.50

How to Make a Vegetable Garden. Fullerton. Garden City, N. Y.: Doubleday, Page & Co. $2.20

The Home Vegetable Garden. Kruhm. New York: Orange Judd Co. $1.00

Manual of Gardening. Bailey, New York: Macmillan Co. $2.00

A Book of Vegetables and Garden Herbs. French. New York: Macmillan. $1.75

Practical Garden Book. Bailey & Hunn. New York: Macmillan. $0.50

Principles of Vegetable Gardening. Bailey. New York: Macmillan. $1.50

Productive Vegetable Growing. Lloyd. Philadelphia: Lippincott.

Biggle Garden Book. Biggle. Philadelphia: Farm Journal Publishing Co. $0.50

The Vegetable Garden. Bennett. New York: Doubleday. $1.21

Vegetable Gardening. Green. St. Paul, Minn.: Webb Publishing Co. $1.00

A Kitchen Garden of One Acre. Van Orman. Philadelphia: Burpee. $0.30

How to Make the Garden Pay. Greiner. New York: Orange Judd Co. $2.00

Vegetables for the Home Garden. Compiled. Philadelphia: Burpee. $0.50

My Handkerchief Garden. Barnard. New York: Rural Pub. Co. $0.50

Peas and Pea Culture. Sevey. New York: Orange Judd Co.	$0.50
Bean Culture. Sevey. New York: Orange Judd Co.	$0.50
Cabbage and Cauliflower. Allen. New York: Orange Judd Co.	$0.50
Celery Culture. Beattie. New York: Orange Judd Co.	$0.50
The New Onion Culture. Greiner. New York: Orange Judd Co.	$0.50
Melon Culture. Troop. New York: Orange Judd Co.	$0.50
Melons for Market. Van Orman. Philadelphia: Burpee.	$0.20
Rhubarb Culture. Morse & Fiske. New York: Macmillan.	$0.50
Root Crops. Burpee. Philadelphia: Burpee.	$0.20
Squashes: How to Grow Them. Gregory. Marblehead, Mass.: Author. Sold by Orange Judd Co. New York.	$0.30
Tomato Culture. Tracy. New York: Orange Judd Co.	$0.50

Farm Fruit Culture

Principles of Fruit Growing. Bailey. New York: Macmillan.	$1.25
The Fruit Garden. Barry. New York: Orange Judd Co.	$1.50
How to Make a Fruit Garden. Fletcher. New York: Doubleday.	$2.20
Popular Fruit Growing. Green. St. Paul, Minn.: Webb Publishing Co.	$1.00
Orchard and Fruit Garden. Powell. New York: Doubleday.	$1.20
Biggle Orchard Book. Biggle. Philadelphia: Wilmer Atkinson Co.	$0.50
Bush Fruits. Card. New York: Macmillan.	$1.50
Small Fruit Culturist. Fuller. New York: Orange Judd Co.	$1.00
Practical Fruit Grower. Maynard. New York: Orange Judd Co.	$0.50
Apples of New York. Beach, *et al.*, 2 vols. Albany: State	$2.25
Grapes of New York. Hedrick, *et al.* Albany: State.	
Plums of New York. Hedrick, *et al.* Albany: State.	
Cherries of New York. Hedrick, *et al.* Albany: State.	

(Last three works above distributed largely by members of

Legislature; "Apples" now reprinted for sale by Commissioner of Agriculture.)

Field Notes on Apple Culture. Bailey. New York: Orange Judd Co. $0.75

The Apple Orchard. Waugh. New York: Orange Judd Co. $1.00

International Library of Technology. Vol. 124.

Fruit Culture: Apples, Pears, Cherries, Apricots and Quinces. Vol. 125. Fruit Culture: Peaches, Plums, Grapes and Small Fruits. Scranton, Pa.: International Text Book Co.

Grape Culturist. Fuller. New York: Orange Judd Co. $1.50

Peach Culture. Fulton. New York: Orange Judd Co. $1.00

Plum Culture. Waugh. New York: Orange Judd Co. $1.50

Quince Culture. Marsh. New York: Orange Judd Co. $1.00

A B C of Strawberry Culture. Terry. New York: Orange Judd Co. $0.35

The Biggle Berry Book. Biggle. New York: American Garden Co. $0.50

Forestry

First Book of Forestry. Roth. Boston: Ginn & Co. $0.75

The Care of Trees. Fernow. New York: Henry Holt.

Principles of Handling Woodlands. Graves. New York, etc.: Wiley. $1.50

Our Trees. Weed. Philadelphia: Lippincott. $3.00

The Farm Woodlot. Cheney & Wentling. New York, etc.: Macmillan. $1.50

Timber Trees of the United States. Elliott. New York, etc.: Houghton Mifflin Co. $2.68

Tree Note Book. Comstock. Ithaca, N. Y.: The Comstock Pub. Co. $0.30

Home Grounds and Flower Gardens

How to Plan the Home Grounds. Parsons. Garden City, N. Y.: Doubleday, Page & Co. $1.10

How to Make a Country Place. Sawyer. New York: Orange Judd Co. $3.00

Landscape Gardening as Applied to Home Decoration. Maynard. New York, etc.: Wiley. $1.50

Lawns and How to Make Them. Barron. Garden City, N. Y.: Doubleday, Page & Co.	$1.21
The American Flower Garden. Blanchan. Garden City, N. Y.: Doubleday, Page & Co.	$1.65
Flowers: How to Grow Them. Rexford. Philadelphia: Penn Pub. Co.	$0.50
The Flower Garden. Bennett. New York: Doubleday.	$1.21
Home Floriculture. Rexford. New York: Orange Judd Co.	$1.00
Gardening for Pleasure. Henderson. New York: Orange Judd Co.	$1.50
House Plants and How to Succeed with Them. Hillhouse. New York: Orange Judd Co.	$1.00
House Plants and How to Grow Them. Barnes. New York: Doubleday, Page & Co.	$1.21
Pansies, Poppies and Sweet Peas. Hutchins. Philadelphia: Burpee.	$0.10
Sweet Peas up to Date. Kerr. Philadelphia: W. A. Burpee.	
Bulbs and Tuberous Rooted Plants. Allen. New York: Orange Judd Co.	$1.50
Chrysanthemum Culture. Morton. New York: Orange Judd Co.	$1.00
The Rose. Ellwanger. New York: Orange Judd Co.	$1.25

Injurious Insects, and Plant Diseases

Insect Book. Howard. Garden City, N. Y.: Doubleday, Page & Co.	$3.30
Insect Life. Comstock. Ithaca, N. Y.: Comstock Pub. Co.	$1.95
Insects: Their Life Histories and Habits. Bastin. New York, etc.: Frederick A. Stokes Co.	$2.50
Injurious Insects: How to Recognize and Control Them. O'Kane. New York, etc.: Macmillan.	$2.00
Our Insect Friends and Enemies. Smith. Philadelphia: Lippincott.	$2.50
Insect Pests of Farm, Garden and Orchard. Sanderson. New York: John Wiley & Sons.	$3.00
Insects and Insecticides. Weed. New York: Orange Judd Co.	$1.25

Insects Injurious to the Household and Annoying to Man. Herrick. New York, etc.: Macmillan. $1.75

The House Fly. Howard. New York, etc.: Frederick A. Stokes Co. $1.60

Insects Injurious to Fruits. Saunders. Philadelphia: Lippincott. $2.00

Insects Injurious to Vegetables. Chittenden. New York: Orange Judd Co. $1.50

Fungous Diseases of Plants. Duggar. Boston: Ginn & Co. $2.00

Plant Diseases. Massee. New York: Macmillan. $1.60

Diseases of Economic Plants. Stevens and Hall. New York: Macmillan. $2.00

The Fungi Which Cause Plant Disease. Stevens. New York, etc.: Macmillan. $4.00

The Spraying of Plants. Lodeman. New York: Macmillan. $1.00

Spraying for Profit. Weed. Chicago: Horticultural Pub. Co.

Fungi and Fungicides. Weed. New York: Orange Judd Co. $1.00

Weeds

Farm Weeds. Clark and Fletcher. Ottawa, Canada: Superintendent of Stationery, Government Printing Bureau. $1.00

Weeds of Farm and Garden. Pammel. New York: Orange Judd Co. $1.50

Weeds and How to Eradicate Them. Shaw. St. Paul, Minn.: Webb Publishing Co. $0.50

A Manual of Weeds. Georgia. New York, etc.: Macmillan. $2.00

Quack Grass Eradication. Crane. St. Paul, Minn.: Webb Pub. Co. $1.00

Bee Keeping

A B C and X Y Z of Bee Culture. Root. Medina, O.: A. I. Root Co. $1.50

Manual of the Apiary. Cook. New York: Macmillan. $1.25

Quinby's New Bee Keeping. Root. New York: Orange Judd Co. $1.00

The Hive and Honey Bee. Langstroth. New York: Orange Judd Co. $1.00

How to Keep Bees. Comstock. Ithaca, N. Y.: Comstock Pub. Co. $1.10

Beekeeping. Phillips. New York, etc.: Macmillan. $1.50

Biggle Bee Book. Biggle. Philadelphia: Wilmer Atkinson Co. $0.50

How to Keep Bees for Profit. Lyon. New York: Macmillan. $1.50

Fifty Years Among the Bees. Miller. Medina, O.: A. I. Root Co. $1.00

Live Stock

Farmers' Cyclopedia of Live Stock. Wilcox & Smith. New York: Orange Judd Co. $4.50

Cyclopedia of Agriculture. Bailey. Vol. III. (See under Agriculture.)

Domestic Animals. Burkett. New York: Orange Judd Co. $3.50

Domesticated Animals and Plants. Davenport. Boston: Ginn & Co. $1.25

Farm Animals. Hunt & Burkett. New York: Orange Judd Co. $1.50

Farm Animals. Wilcox. New York: Doubleday. $2.20

Manual of Farm Animals. Harper. New York: Macmillan. $2.00

Beginnings in Animal Husbandry. Plumb. St. Paul, Minn.: Webb Pub. Co. $1.25

Principles and Practice of Judging Live Stock. Gay. New York, etc.: Macmillan. $1.50

Principles of Animal Nutrition. Armsby. New York: Wiley. $3.75

Feeds and Feeding. Henry. Madison, Wis.: Author. $2.50

Feeding of Animals. Jordan. New York: Macmillan Co. $1.25

Stock Feeds and Feeding. Halligan. Easton, Pa.: Chemical Publishing Co. $2.50

Feeding Farm Animals. Shaw. New York: Orange Judd Co. $2.00

Profitable Stock Feeding. Smith. St. Paul, Minn.: Webb Pub. Co. $1.50

Bovine Tuberculosis and Its Control. Moore. Ithaca, N. Y.: Carpenter & Company.	$2.00
Veterinary Studies for Agricultural Students. Reynolds. New York, etc.: Macmillan.	$1.75
Diseases of Animals. Mayo. New York: Macmillan Co.	$1.50
Farmers' Veterinary Adviser. Law. New York: Orange Judd Co.	$3.00
Handbook for Farmers and Dairymen. Woll. New York: Wiley.	$1.50
Principles of Breeding. Davenport. Boston: Ginn & Co.	$2.50
Breeding Farm Animals. Marshal. Chicago: Sanders Publishing Co.	$1.50
Animal Breeding. Shaw. New York: Orange Judd Co.	$1.50
Stock Breeding. Miles. New York: Orange Judd Co.	$1.50
Breeding of Farm Animals. Harper. New York: Orange Judd Co.	$1.50
Types and Breeds of Farm Animals. Plumb. Boston: Ginn & Co.	$2.00
The Horse. Roberts. New York: Macmillan.	$1.25
Hints to Horse Keepers. Herbert. New York: Orange Judd Co.	$1.50
Biggle Horse Book. Biggle. Philadelphia: Wilmer Atkinson Co.	$0.50
Management and Breeding of Horses. Harper. New York: Orange Judd Co.	$2.00
The Training and Breaking of Horses. Harper. New York, etc.: Macmillan	$1.75
Horse Breeding. Sanders. Chicago: Sanders Pub. Co.	$1.50
The Family Horse. Martin. Chicago: J. H. Sanders Pub. Co.	$1.00
Winter Care of Horses and Cattle. Terry. New York: Orange Judd Co.	$0.35
American Cattle. Allen. New York: Orange Judd Co.	$2.50
Cattle Breeding. Warfield. Chicago: Sanders Pub. Co.	$2.00
Management and Feeding of Cattle. Shaw. New York: Orange Judd Co.	$2.00
Cattle Feeding. Stewart. New York: Orange Judd Co.	$2.00
Beef Production. Mumford. Urbana, Ill.: Author.	

The Story of the Herefords. Alvin H. Sanders. Chicago, Ill.: Sanders Pub. Co.	$2.00
Shepherd's Manual. Stewart. New York: Orange Judd Co.	$1.00
The Sheep. Armatage. London: Warne.	$1.00
Sheep Farming in America. Wing. Chicago: Sanders Pub. Co.	$1.00
Sheep Feeding and Farm Management. Doane. Boston: Ginn and Co.	$1.00
Sheep Farming in North America. Craig & Marshall. New York, etc.: Macmillan.	$1.50
Management and Feeding of Sheep. Shaw. New York: Orange Judd Co.	$2.00
Biggle Sheep Book. Biggle. Philadelphia: Wilmer Atkinson Co.	$0.50
Swine Husbandry. Coburn. New York: Orange Judd Co.	$1.50
Raising Hogs for Profit. Bowersox. Bradford, O.: M. L. Bowersox Breeding Co.	$2.00
Swine. Dietrich. Chicago: Sanders Pub. Co.	$1.50
The Pig. Harris. New York: Orange Judd Co.	$1.00
Home Pork Making. Fulton. New York: Orange Judd Co.	$0.50
Biggle Swine Book. Biggle. Philadelphia: Wilmer Atkinson Co.	$0.50
International Library of Technology. Vol. 122.	
Animal Feeding and Breeding. Dairying and Beef Products. Vol. 123.	
Swine, Sheep and Horses. Scranton, Pa.: International Text Book Co.	
The Pet Book. Comstock. Ithaca, N. Y.: Comstock Pub. Co.	$2.50
Biggle Pet Book. Biggle. Philadelphia: Wilmer Atkinson Co.	$0.50

Dairying

First Lessons in Dairying. Van Norman. New York: Orange Judd Co.	$0.50
The Farm Dairy. Gurler. Chicago: Sanders Pub. Co.	
Dairy Cattle and Milk Production. Eckles. New York: Macmillan.	$1.60

American Dairying. Gurler. New York: Orange Judd Co. $1.00

Dairy Science. Woll. New York: Wiley. $1.50

Milk and Its Products. Wing. New York: Macmillan. $1.50

Principles of Modern Dairy Practice. Woll. New York: Wiley. $1.25

The Business of Dairying. Lane. New York: Orange Judd Co. $1.25

Biggle Cow Book. Biggle. Philadelphia. Wilmer Atkinson Co. $0.50

Profitable Dairying. Peck. New York: Orange Judd Co. $0.75

Keeping One Cow. New York: Orange Judd Co. $1.00

Chemistry of Dairying. Snyder. Easton, Pa.: Chemical Pub. Co. $1.50

Modern Methods of Testing Milk and Milk Products. Van Slyke. New York: Orange Judd Co. $0.75

Testing Milk and Its Products. Farrington and Woll. Madison, Wis.: Mendota Book Co. $1.25

A B C in Buttermaking. Monrad. Wheaton, Ill.: Author (Sold by Webb Pub. Co., St. Paul.) $0.50

Buttermaking. McKay & Larsen. New York: Wiley.

Creamery Buttermaking. Michels. Lansing, Mich.: Author. $0.75

Milch Hygiene. Jensen. Philadelphia: Lippincott.

Pure Milk and Public Health. Ward. Ithaca, N. Y. Taylor & Carpenter. $2.00

Dairy Bacteriology. Conn. (See under Bacteriology.)

Cheese Making. Van Slyke & Publow. New York: Orange Judd Co.

Decker, Cheese Making. Rev. ed. by F. W. Woll. Madison, Wis.: Mendota Book Co. $1.75

Poultry

Farm Poultry. Watson. New York: Macmillan. $1.25

Our Domestic Birds. Robinson. Boston: Ginn & Co. $1.35

Poultry Book. Weir. Garden City, N. Y.: Doubleday, Page & Co. $1.65

The Beginner in Poultry. Valentine. New York, etc.: Macmillan Co. $1.50

How to Keep Hens for Profit. Valentine. New York, etc.: Macmillan Co. $1.50

The Business Hen. Collingwood. New York: Rural Pub. Co. $0.75

Low Cost Poultry Houses. Darrow. New York: Orange Judd Co. $0.25

Poultry Architecture, Fiske. New York: Orange Judd Co. $0.50

Turkeys and How to Grow Them. Myrick. New York: Orange Judd Co. $1.00

Turkeys, Ducks and Geese. Nourse. St. Paul: Webb Pub. Co. $0.50

Diseases of Poultry. Salmon. New York: Orange Judd Co. $0.50

Perfected Poultry of America. McGrew & Howard. Washington: Howard Publishing Co. $2.50

Biggle Poultry Book. Biggle. Philadelphia: Wilmer Atkinson Co. $0.50

International Library of Technology. Vol. 114.,

Poultry: Housing, Feeding, Incubation, Breeding and Egg Production. Vol. 115.

Poultry Farming: Appliances, Enemies, Diseases. Vol. 116.

Notes on Turkeys, Peafowls, Guinea Fowls and Pheasants, Water Fowls and Squabs. Vol. 116.

Standard-Bred Poultry: With Notes on American, Asiatic, Belgian, Dutch and German Breeds. Vol. 117.

Standard-Bred Poultry: Notes on English, French, Polish, Game and Mediterranean Breeds. Bantams, Pheasants, Ducks and Geese. Scranton, Pa.: International Textbook Co.

Rural Structures, Appliances and Engineering

Country Home. Powell. Garden City, N. Y.: Doubleday, Page & Co. $1.65

Successful Houses and How to Build Them. White. New York, etc.: Macmillan. $2.00

Home for Home Builders. King. New York: Orange Judd Co. $1.00

Country House. Hooper. Garden City, N. Y.: Doubleday, Page & Co. $1.65

The Building of It. Keith. Garden City, N. Y.: Doubleday, Page & Co. $1.00

Farm Structures. Ekblaw. New York, etc. Macmillan $1.75

Farm Buildings. Compiled. Chicago: Sanders Pub. Co. $2.00

Barn Plans and Outbuildings. Powell. New York: Orange Judd Co. $1.00

Farm Appliances. Compiled. New York: Orange Judd Co. $0.50

Farm Conveniences. Compiled. New York: Orange Judd Co. $1.00

Farm Machinery and Farm Motors. Davidson and Chase. New York: Orange Judd Co. $2.00

Power and the Plow. Ellis & Rumely. Garden City, N. Y.: Doubleday, Page & Co. $1.50

Electricity for the Farm and Home. Koester. New York, etc.: Sturgis & Walton Co. $1.00

Gas Engines for the Farm. Hirshfield. New York, etc.: Wiley. $1.50

Practical Talks on Farm Engineering. Clarkson. Garden City, N. Y.: Doubleday, Page & Co. $1.00

Agricultural Engineering. Davidson. St. Paul, Minn.: Webb Pub. Co. $1.66

Highway Construction. Alfred E. Phillips. Chicago: American Technical Society. $1.00

Roads, Paths, and Bridges. Page. New York, etc.: Sturgis & Walton Co. $1.00

Fences, Gates and Bridges. Compiled. New York: Orange Judd Co. $0.50

Farm Blacksmithing. Drew. St. Paul, Minn.: Webb Pub. Co. $0.50

The Farmstead. Roberts. (See under Agriculture.)

(See also section on Rural Hygiene.)

Rural Hygiene

Health on the Farm. Harris. New York, etc.: Sturgis & Walton Co. $1.00

Elementary Hygiene and the Home Care of the Sick. Delano and McIsaac. Philadelphia: Blakiston. $1.00

Elements of Hygiene and Sanitation. Hough & Sedgwick. Boston: Ginn & Co.

Rural Hygiene. Ogden. New York: Macmillan Co. $1.50

Air, Water and Food from a Sanitary Standpoint. Richards & Woodman. New York: Wiley. $2.00

Home Sanitation. Richards and Talbot. Boston: Dana, Estes & Co. $0.25

Rural Hygiene. Brewer. Philadelphia: Lippincott. $1.25

School Hygiene. Burgerstein. New York, etc.: Frederick A. Stokes Co. $1.00

The Health Master. Adams. New York, etc.: Houghton Mifflin Co. $1.36

Pure Milk and the Public Health. Ward. Ithaca, N. Y.: Carpenter & Co. $2.00

Memoranda on Poisons and their Antidotes and Tests. Tanner. Philadelphia: Blakiston. $0.75

Sanitation and Sewage Disposal for Country Homes. Davidson. Columbia, Missouri: Engineering Experiment Station, University of Missouri.

Plumbing and Household Sanitation. Putnam. Garden City, N. Y.: Doubleday, Page & Co. $4.10

Practical Methods of Sewage Disposal. Ogden. New York, etc.: Wiley. $1.50

Farm Sewage. Santee. New York: Orange Judd Co. $0.50

Home Water Works. Lynde. New York, etc. Sturgis & Walton Co. $1.00

How to Drain a House. Waring. Boston: Osgood & Co. $1.00

Ventilation. King. Madison, Wis.: Author. $0.50

The House Comfortable. Ormsbee. New York: Harper. $1.00

Rural Economy and Sociology

The Training of Farmers. Bailey. New York: Macmillan Co. $1.00

The Young Farmer: Some Things He Should Know. Hunt. New York: Orange Judd Co. $1.50

Farm Development. Hays. New York: Orange Judd Co. $1.50

Farm Management. Card. New York: Doubleday. $2.20

Farm Management. Warren. New York, etc.: Macmillan. $1.75

Farm Management. Boss. St. Paul, Minn.: Webb Pub. Co. $0.90

Farmers' Business Handbook. Roberts. New York: Macmillan. $1.25

Principles of Bookkeeping and Farm Accounts. Bexell and Nichols. New York, etc.: American Book Co. $0.65

Bookkeeping for Farmers. Atkeson. New York: Orange Judd Co.	$0.25
Systematic Bookkeeping for Farmers. Baird. Geneva, N. Y.: F. M. Baird Co.	$1.00
Farm Bookkeeping. Lamb. New York: Thomas Press.	$1.00
Law for the American Farmer. Green. New York: Macmillan.	$1.50
Farmers' Law. Koos. St. Paul, Minn.: Webb Pub. Co.	$0.50
Descriptions of Land. Cautley. New York, etc.: Macmillan.	$1.00
Markets for the People. Sullivan. New York, etc.: Macmillan.	$1.25
Cooperation in Agriculture. Powell. New York, etc.: Macmillan	$1.50
Cooperation Among Farmers. Coulter. New York, etc.: Sturgis & Walton Co.	$1.00
How to Cooperate. Myrick. New York: Orange Judd Co.	$1.50
The Principles of Rural Credits. Morman. New York, etc.: Macmillan.	$1.50
Principles of Rural Economics. Carver. Boston: Ginn & Co.	$1.30
Agricultural Economics. Taylor. New York: Macmillan.	$1.25
Rural Wealth and Welfare. Fairchild. New York: Macmillan.	$1.25
The State and the Farmer. Bailey. New York: Macmillan.	$1.25
Constructive Rural Sociology. Gillette. New York, etc.: Sturgis & Walton Co.	$1.75
Chapters in Rural Progress. Butterfield. Chicago: University of Chicago Press.	
Rural Life Problem. Plunkett. New York: Macmillan.	$1.25
Country Life Movement. Bailey. New York: Macmillan.	$1.25
Report of the Commission on Country Life. New York, etc.: Sturgis & Walton Co.	$0.84
Rural Life and Education. Cubberley. New York, etc.: Houghton Mifflin Co.	$1.50
Rural Life and the Rural School. Kennedy. New York, etc.: American Book Co.	$0.80

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